THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE.

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STUDIES IN ECONOMICS AND POLITICAL SCIENCE

EDITED BY

THE HON. W. PEMBER REEVES,

Director of the London School of Economics.

No. 40 in the Series of Monographs by Writers connected with the School of Economics and Political Science.

RAILWAY RATES AND TRAFFIC

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TRANSLATED FROM THE THIRD (1907) EDITION OF
C. COLSON'S "TRANSPORTS ET TARIFS"
BY L. R. CHRISTIE, G. LEEDHAM, AND C. TRAVIS

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WITH AN INTRODUCTION BY
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LONDON
G. BELL AND SONS, LTD.
1914

PREFATORY NOTE

In presenting this abridged translation of M. Colson's famous work, *Transports et Tarifs*, the writer of this note would record the thanks of the translators, firstly, to Mr. W. M. Acworth—who has very kindly written the Introduction—for inspiring the translation, and, secondly, to the London School of Economics for co-operation in giving effect to this inspiration. For it was entirely due to Mr. Acworth's kindly remarks on the series of five articles (included in Part I.), which appeared in the *Railway Gazette* in the early part of last year, and his observations that the translation might serve a useful purpose in book form, that the writer and his colleagues were led favourably to consider the translation of further sections of M. Colson's valuable work.

The primary intention was merely to deal with the sections of general interest (Parts I. and IV.), but on the suggestion of the London School of Economics that a short sketch of the practice in various countries would be of utility, other "fragments relevant" have been incorporated in the work (Parts II. and III.), these serving to indicate the prime characteristics of the railway rates question in the particular countries.

Certain licence has, of necessity, been taken in the translation in order to furnish, for the benefit of English readers, clear description of the many fundamental economic principles analysed. In thus clarify-

ing the text, however, the writer has endeavoured carefully to retain the trend of the arguments of M. Colson, to whom he and his colleagues wish to express their gratitude for so kindly permitting the translation. Their thanks are also due to Mr. J. A. Kay, Managing Editor of the *Railway Gazette*, for permission to utilise the articles published in that journal. In concluding this brief note, the writer would add his personal indebtedness to Mr. W. Tetley Stephenson, B.A., for invaluable criticism of proofs.

CHAS. TRAVIS.

GREAT CENTRAL RAILWAY,
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LONDON, N.W.

October, 1914.

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INTRODUCTION

INTRODUCTION

THE authors of this translation give me credit for inspiring it. They, however, are still but young, and I am sure do not know how many days have passed since first I cast my bread upon the waters. As long ago as January, 1892, I published in the *Nineteenth Century* a review of M. Colson's book, the first edition of which had then just appeared. And in December of the same year the same journal printed a paper of mine read before the British Association, urging the necessity of the study of railway questions by English economists. Naturally, therefore, I welcome to-day a translation that makes large sections of M. Colson's great work accessible to English readers. And I welcome the fact that the translation is made as one more proof that at long last English people who invented railroads are coming to regard them as a subject for scientific study.

I confess I am sorry that the work could not have been translated in its entirety, though I am bound to

admit that, if railway books are to be regarded like railways themselves, as commercial enterprises, I am not surprised. Some day let us hope there will be in England, what there already is in the other great railway countries of the world, a sufficiently large number of readers to justify books on a more ambitious scale. And let us hope that Mr. Travis and his colleagues may be encouraged by the reception of this book to undertake more ambitious enterprises hereafter.

Among the untranslated portions of M. Colson's work there are several that should, and I believe would, be interesting to English readers. I may mention particularly the account of the elaborate organisation of the French roads, which surely might offer us some guidance in our attempt to evolve cosmos out of the chaos of our English road policy; and the discussion of canal policy and the comparative advantages of railway and inland water transport. Some of us have for years challenged canal advocates to prove that inland water transport is economical as compared to railway transport. M. Colson shows conclusively that it cannot be.

But I must not dwell upon what the book before

us does not contain ; for it does contain quite enough to set most of us thinking very seriously. The French table of maximum rates as laid down in the schedule annexed to each concession is divided, as every student knows, into two parts, termed respectively, the toll (*péage*), and carriage charge (*prix de transport*). No one, I think, will be able to read this book, with its constant insistence upon the fact that the latter half represents out of pocket cost which the railway must obtain if it is to continue to be operated ; while the former half represents interest on capital, which, though desirable, is not necessary for continuous operation, without remembering for the rest of his life one of the fundamental facts of railway economics. When the reader goes further and follows the discussion of the cost of carriage of " the extra ton," he will have got a long way towards understanding the essential argument of special rates, and he will be able to smite with unanswerable argument the man in the street who chatters about the railways carrying one class of traffic at the cost of another.

Special attention should, I think, be called to Chapter V. (of Part I.), which is summarised in the

graphic illustration on p. 45. This diagram shows with remarkable clearness how the total utility of a given road is the same whatever tolls are charged, or, in other words, whatever the rates be, provided they are above the point where they cover out of pocket costs, and below the point where they prevent the traffic from passing. But it shows also, and this is the important point, that it is upon the method of tariffication (I make no apology for helping to acclimatise a quite necessary word) adopted that the proportion of the total utility accruing to the owners of the railway and the public at large respectively depends.

But I must not attempt, within the limits of an introduction, to enumerate all the economic points that M. Colson illuminates by his treatment of them. I will only say that in my judgment, even though to English readers it suffers from the disadvantage that it is written from the French point of view, it is, take it altogether, the most valuable work in existence on the special subject of transport economics. And English students are much indebted to the translators for making it accessible. But, by the way, why do

they hesitate to translate the expression *co-efficient d'exploitation*, and only put in a footnote the lengthy paraphrase, "Percentage ratio of expenses to receipts?" Surely "operating ratio," which is the recognised equivalent in America, is both good English and intelligible.

W. M. ACWORTH.

PART I

THE ECONOMIC CONSIDERATIONS WHICH DETERMINE THE COST OF TRANSPORT

CHAPTER I

PRINCIPLES AFFECTING TRANSPORTATION COSTS

THE cost of transportation is dependent partly on the location of the lines of communication, partly on the methods of administration—judicial and financial—to which lines are subjected, and partly upon the users thereof; and the economic laws from which the connection is derived are merely a modification of the general theory of prices. Certain elements are peculiar to railways with competition and to those which are monopolies, according to the particular nature of the different means of transport, but the general laws to which the determination of prices is subject in either of these cases hold sway over the whole of the transport industry.

It is advisable, therefore, before dealing with special factors involved in each mode of transport to consider the economic laws which govern the variation of prices, as it is necessary to keep these laws in mind in order to avoid certain grave errors into which one is apt to fall when dealing with the question of transport without having reasoned out the quite simple principles which govern it.

We ought to recall at the commencement, that the total charge for carriage generally includes two distinct elements: first, the toll paid for the use of the road, and, second, the actual transport, this comprising

the use of vehicles, haulage expenses, and the wages of the necessary staff. The vagueness of the term often leads to regrettable comparison between the latter element and the gross charge, and in order to understand how each of these elements and their gross total are determined the matter must be studied from the point of view of the buyer and seller of the service.

The buyer attaches to such transport a value which he estimates at a certain sum; that sum represents to him the maximum charge that he will consent to pay rather than decline the facilities offered. On the other hand, the transport occasions certain expenses to those who deal in or sell it, such expenses representing the minimum remuneration they must obtain to induce them to co-operate in the transaction.

The charges actually paid are subject to certain laws, and an account of the causes which influence the maximum and the minimum between which they are situated must be given; also the reasons that induce them to approach sometimes the one, sometimes the other. We will first demonstrate that, generally speaking, "actual transport" charges are fixed in the vicinity of the minimum, but the toll which is added tends to approach the gross total of the maximum. We will then see what are the rules followed in fixing the rate and the consequences, from the point of view of general interest, of the raising of this rate.

CHAPTER II

VALUE OF THE SERVICE OF TRANSPORT

THE total amount that may be asked for the service of transport is limited by the value which such service has for the person who is to profit by it, *i.e.*, for the owner of merchandise, or for the passenger. The value thus corresponds to the appreciation of the utility of an object by the one interested, this being termed, in the language of political economy, "the utility value," in contradistinction to "the value of exchange," that is, the price actually paid by virtue of the general law of supply and demand; it is this we shall designate by the phrase "value of the service of transport" throughout this study. We will now attempt to discover in what it consists and how it is determined.

So far as goods are concerned, the value of transport is nothing else than the augmentation of value which transport gives to the articles, *i.e.*, the difference between the value of an object at the point of departure and its value at the point of arrival. Let us suppose, for example, that by reason of local conditions of production and consumption, a ton of the same casting is worth 45 francs in Meurthe-et-Moselle and 75 francs in the Loire country. By transporting a ton of that casting from Nancy to Saint-Etienne its value is increased by 30 francs so that the actual carriage is worth 30 francs. It is clear, therefore, that if it be

possible to transfer the casting for a lower price than 30 francs (say) 25 francs, the transport would take place, for there would be the advantage of selling at 75 francs in the Loire district the casting, the net cost of which was 70 francs—45 francs purchase price in Meurthe-et-Moselle and 25 francs the cost of carriage, If, on the contrary, the cost of carriage exceeded 30 francs, there would be no disposition to send the traffic to Saint-Etienne at the price of 80 francs—45 francs purchase price and (say) 35 francs for carriage —because a similar article could be obtained there at 75 francs. The "value of the service of transport," as defined above, is then the highest limit of the gross charge which such transport can pay.

It is clear, on the other hand, that communication established between two markets will affect prices. If the carriage of an unlimited quantity of castings is possible from Nancy to Saint-Etienne at 25 francs, the difference in the market price would not vary appreciably, but the manufacture of castings at Saint-Etienne and in the Loire district could only continue providing the actual cost of manufacture remains the same. Further, what we will call the transportation market is subject to constant fluctuations, the extent of which cannot be predetermined. According to the circumstances it will tend sometimes to exceed 25 francs and sometimes to fall below that figure. In the first instance, large consignments from Nancy to Saint-Etienne would cause a rise to Nancy and a fall to Saint-Etienne until the prices approximate 25 francs. In the second case, the consignments would diminish until the difference in the prices closed up, and allowed a reasonable profit on the castings.

If, at last, the charge for transport descends to such a

figure that the Meurthe-et-Moselle casting is sold in the Loire districts at a price lower than it can be produced at the local works, the latter would be obliged to close down or devote themselves to other departments in which they are in a better position to compete. Again, it is not, of course, possible to know what the cost of a transported article would be if the transport does not take place. It becomes, therefore, very difficult to estimate the value of the service of transport.

Even when all the products of a certain kind sold in a particular market come from outside sources, they do not all come from the same point. The price of each kind of merchandise, in each region, depends, not only on the local conditions of production and consumption, but on the facilities, more or less great, for conveying the merchandise from very different regions for selling in varied markets the surplus of production. The value of the service of transport from A to B does not, then, depend solely on the economic situation at these two points, but also on the cost of transportation between either of the two, and a quantity of other points, C, D, E, etc., so that the price which can be asked for transportation from A to B depends, at the same time, on the price which is asked from A to C, B to A, A to E, etc.

Elements that Determine Value

The elements which enter into the determination of the value of the service of transport are too diverse for the development of any general formula, but there are certain circumstances in which the influence may be perceptible, and it is advisable to examine these in advance.

The first of these circumstances is *distance*. Generally speaking, the value of the service of transport between two points will be greater as the distance between these two points increases. Climatic, geological and economic differences are more pronounced as the merchandise is moved further from the point of departure. There is a chance, too, that the difference between the price of like goods is accentuated as the source of production gets further away and that the value of the service of transport is increased accordingly. This is, however, not an invariable law. The net cost of similar produce at two points, a considerable distance apart, is sometimes approximately the same, and the value of the service of transport is then almost nil, whilst very unequal differences of cost are often found where the distance from the source of supply is the same. For instance, so far as agricultural products are concerned, the distances on the same meridian—implying differences of climate which are most marked—often allow differences in prices greater than those for like distances counted following the parallels. In any case, the value of an act of conveyance does not always increase in proportion to the distance; if it is normally greater at 500 kilometres than at 100 kilometres, there is no reason why the charge should be five times as great. The difference is generally much less, as the sale, at great distances, of merchandise the production of which is not peculiar to one locality, or for which other material can be offered in substitution, would be impossible if the cost of transport were to increase proportionately with the distance.

The second circumstance which exercises a general influence on the value of transportation is *the value*

of the merchandise conveyed. Ordinarily, the cost of transport, which different kinds of merchandise are able to bear for the same distance rises as the goods have more and more value. The value of the service of transport, we have stated, is the difference between the value of the object transported at the forwarding point A, and at the destination point B. In general, this difference is the greater as the values in comparison are themselves greater. Different conditions of production and consumption will cause a difference between the Champagne country and the Alps of 100 francs in the value of woollen goods, which originally cost 1,500 or 2,000 francs per ton, and this much more easily than a difference of 20 francs between the value at the same places of stone or wood, which do not cost 100 francs per ton. Merchandise which can pay dearly for transport is usually of an expensive nature. This law, however, even as the previous one, is not absolute, as it is possible that between two given centres the difference in value of certain valuable goods may be very small, whilst very common objects have highly differing values; these common objects would then be able to bear raised prices of transport, whilst the valuable goods would only be carried if the cost of transit was trifling.

Between two points the value of merchandise may change considerably with the use which will be made of the merchandise at the point of destination. Between a coal district and a town situated where there is no fuel the transport of the first few tons has an enormous value. One must keep warm and cook food, and in order to have the means of satisfying these primitive needs people will pay regardless of cost. Yet, in order to develop the use of coal for industrial purposes, it is

necessary to lower the price of transport appreciably, as certain industries cannot thrive if coal is not obtainable cheaply and these industries are chiefly those which consume most coal, *e.g.*, the metal industry.

It should, however, be pointed out that the sale price in the town must include the purchase price at the point of production together with the cost of transport. The consumers who might have had to pay a higher price for coal would benefit by any reduction in that price, whilst the coal would not be transported if the selling price were prohibitive. But if this business in coal were only carried on in this town at a price governed by the expense of each trip from the coalfield to the consumer, and the cost of the latter was fixed according to the value of the service of transport, the transit charges would constantly vary and that between very wide limits.

The same peculiarities are in force for the carriage of passengers. Each journey has a certain value to him who makes it. That value is the advantage which he expects to derive if it is a question of business ; or, if it is a question of pleasure, then it is the value he places on that pleasure. The maximum charge that the traveller is disposed to pay varies with his income, the importance of the interests involved, the attraction distant places have for him, and with the duration and conditions of the journey. There are still many other circumstances which cause the value of the service of transport to vary.

We will now see how one can, by certain rules, differentiate between the classes of journeys and of persons for which that value will be more or less of importance. One cannot formulate any actual rule for the determination, as individual circumstances

cause variations. Thus, the value of an act of conveyance, as affecting merchandise or passengers, can be measured by an exact figure which constitutes the maximum charge below which transport will be effected, and above which transport will not take place. That figure depends on a number of circumstances in which distance, the nature of the merchandise, its destination, and the social position of the traveller are elements. None of these, however, plays a sufficiently important part to allow of the actual value of the various services being calculated even as a rough approximation from a general formula.

CHAPTER III

ADDITIONAL NET COST

It is necessary, in connection with the maximum rate —the amount of which is governed by the value which transport has for him who pays for it—to ascertain the minimum remuneration which the companies providing the transport must obtain in order to recoup themselves for their expenditure. This includes haulage expenses, expenses of staff, general expenses, maintenance of way and works expenditure, etc., and, finally, the interest on, and amortisation of, capital according to the mean rate at which money is borrowed for industrial undertakings, allowing for analogous risks.

In studying the minimum price care must be taken to distinguish between (1) the average net cost of transporting traffic, and (2) the net cost of carriage of one ton of goods regarded as a pure addition to the pre-existing flow of traffic, or what is often termed the net cost of an additional ton. This, in accordance with the proposal of M. Considére, we shall designate " additional net cost " throughout this work.

The additional net cost is the lowest limit of the gross charge for each act of conveyance. Indeed, so long as the charge offered to the carrier for the conveyance of a certain consignment is higher than the expense he must incur in adding that consignment to the traffic he already has, it is to his interest to take it.

Similarly, from the point of view of the toll, the owner of the road derives an extra advantage from the passing of every extra ton of goods and for every passenger over and above the traffic he already has, provided that the charge paid is greater than the additional expenditure on maintenance and administration.

It is, however, not sufficient for an undertaking merely to cover the transportation expenses of each unit conveyed, as general charges have to be met, independently of the volume of traffic, and therefore, on the whole of the traffic transported, the carrier must realise sufficient profit to cover the general charges. If a single act of conveyance be taken, however, it is clear that directly the amount received for such service is in excess of the actual transport expenses, the additional net cost is covered and it contributes in some measure to the general charges. This principle then is advantageous, and as long as traffic can be secured at a price in excess of the additional cost it is profitable to the carrier to convey it. Inversely, no traffic should be conveyed below the additional net cost, as this represents the minimum remuneration which the carrier must obtain to perform the service.

The additional net cost differs widely as it is considered from the point of view of (1) covering the whole expense of its transport, and (2) covering the mere movement expense. In the former case a further distinction must be made in accordance with the regularity or otherwise of the traffic. Transportation demands the establishment of a number of vehicles, or boats, of capacity in proportion to the weight to be conveyed, and the expenses are then in proportion to the tonnage transported, the cost of each extra ton being almost equal to the average cost of the lot. On the

contrary, if a vehicle is not loaded to its highest capacity the additional net cost of any traffic added to the load hardly augments the expenses. Provided that transport between two places is of sufficient importance to necessitate fully loaded vehicles travelling regularly and that the prevailing conditions permit the wagons to be retained until loaded to their full capacity, the additional net cost approximates the average net cost.

The difference which exists in the nature of commodities brings about notable differences in the net cost of transport; for example, granted equal weight, light goods passing in large quantities and goods requiring careful packing are far more expensive to handle than rough and heavy goods. The average net cost is not the same for the different categories, but the differences are rarely considerable, as the loading and hauling expenses always represent the main element.

When regular services are considered, especially if they have to be undertaken by means of powerful units, the capacity of which is not easily adaptable to the requirements, the difference between the additional net cost and the average net cost may be very considerable. This is notably the case in connection with regular services by sea. If a ship capable of carrying a certain quantity and reaching a definite speed is scheduled to sail on a certain day it will sail whether it has a full load or not. Even if it be loaded to only half its capacity the same general expenses will operate, and the average net cost will therefore be high. It will be clear, however, that the actual net cost of any addition to the quantity for conveyance would be but small.

We shall see later on that the frequency and type of

regular services is ruled by the use made of them. The case of half-full boats plying between two points is exceptional, and would scarcely be continued. On the contrary, such a case is frequent on the railways. All railway working presupposes a minimum number of trains fixed by the time tables. If these trains travel almost empty the working expenses are a little less than if they ran fully loaded, but the difference is insignificant, and, so far as the traffic does not necessitate an increase in the number of trains, the transport of one ton or one passenger extra does not entail any additional expense. It is only when boats or trains, corresponding to the service demands, attain their full load, that the additional net cost of each extra ton becomes clearly perceptible, as it is then necessary to increase the service proportionately to the addition to the traffic.

The additional net cost must never be confused with the average cost, however, because all regular services carry with them a permanent organisation of offices, warehouses, etc., which entail certain general expenses. Should a railway by reason of increased traffic find it necessary to increase the number of trains, the increased expenditure is far from being in proportion to that of the traffic, as the expense of manning stations, maintaining the permanent way, and the working of the signals is largely constant and practically independent of the tonnage transported.

The additional net cost of transport of one ton of goods is then far from being equal to the quotient obtained after dividing the working expenses by the gross tonnage. It is only when the traffic happens to be large that the permanent charges spread over the whole of the consignments become negligible for each

unit, and that the additional net cost and average net cost are blended.

Whether it is a question of regular services or not it is important to observe that the additional net cost can only be estimated by taking into account the respective volumes which the currents of traffic present on a road in both directions, as it is very rare that the currents are the same in both directions and the difference is often very large. The number of carriages, boats or trains that it is necessary to put on the route must be sufficient to effect all the transport in the one direction although a great number of vehicles may return empty. The additional net cost in one direction is then ruled by the expense of having to effect the transport with the probability of the vehicles returning empty, whilst the additional net cost of traffic which may be conveyed in the reverse direction is almost nil. This explains how the price of freight movement can be reduced to an extremely low figure from the great industrial centres where large quantities of fuel, materials and food products, representing a considerable tonnage, are received, and but an insignificant weight of manufactured goods, possibly of great value, is despatched.

The organisation of the service of transport, however, cannot immediately be adapted to traffic fluctuations. The additional net cost of a similar consignment would be smaller in the slack season when equipment and staff were only partially employed than at times of great commercial activity when every increase in traffic necessitates increased facilities.

If we now pass to the expenses which are to be remunerated by means of the toll, and not the price of actual transport, the phenomenon which we have

just noted for regular services with small traffic becomes general; the expenses pertaining to an extra ton are almost nil as, though the maintenance of a road and the expenses of administration undoubtedly vary to a certain extent with the traffic, they comprise a sufficiently constant quantity for the variation to be ignored.

The most important fact in this respect is that the interest on capital absorbs a much larger sum each year than the expenses of administration. The roads and streets are the only ways where this is not true. In the case of navigable waterways and ports, the capital expended in France is 2,800,000,000 francs, whilst the total annual expenses are only 33,000,000 francs. On railways, the only highways where tolls are now in operation, the annual charges on capital (not including the rolling stock) amount to 800,000,000 francs whilst the maintenance of way, works, etc., does not exceed 150,000,000 francs.

Further, the interest charges on the capital expended for the initial establishment of a public highway are the same whether the road be utilised little or much, and whilst this capital varies with the technical conditions, which are themselves determined according to the probable use of the road, the expense is not decreased by the traffic attaining the expected density or remaining below it. The initial capital expense cannot, therefore, be regarded as an element in the additional net cost of transport. It is true, however, that if the traffic later becomes so dense as to necessitate the doubling of the roads where railways are concerned, of locks on the canals, the enlargement of the docks at ports, etc., the remuneration of the additional capital becomes one of the functions of the tonnage trans-

ported, and its augmentation then enters into the additional net cost by a certain fraction of which it is necessary to take account.

It is obvious then that the distinction between the expenses corresponding to each act of conveyance, which constitute its additional net cost, and the permanent expenses of the undertaking which enter into the average net cost of the traffic transported, does not exactly coincide with the distinction laid down in railway accounts between the expenses of operation (administration, management, traction, maintenance of way, etc.), and the interest on capital. Neither does it coincide with the distinction between the toll corresponding to the expenses of the road (interest on capital and maintenance) and the actual transport, as the latter must cover the additional expenses and the interest on the working stock capital.

The fixed expenses, however, do not differ greatly from the interest on the capital employed, and include the expenses to be covered by a toll. The expenses varying with the traffic are mostly the expenses of operation of which the principal element is, unquestionably, the actual transport. The three methods of dividing the total expenses lead very nearly to the same result, but it is important to bear in mind that in all circumstances a great portion of the interest on capital constitutes a fixed charge which does not influence the additional net cost, and that as an analogous phenomenon is produced for a section of the transportation expenses, in connection with regular services by railway, this exercises a considerable influence on the fixing of rates.

CHAPTER IV

VARIATION OF PRICES BETWEEN THE VALUE OF THE SERVICE OF TRANSPORT AND THE ADDITIONAL NET COST

We have just seen that the effective prices of transport are necessarily comprised within certain limits, these being sometimes in proximity to one another, and sometimes very far apart. For example, if a commodity is worth 120 francs in Lyons and 150 francs in Paris, and the expense of conveying the same from Lyons to Paris is 3 francs, the total price of transport may vary between 3 francs and 30 francs without preventing the transport. On the contrary, when the value of an act of conveyance is very near its net cost, the price which can be obtained for the transport, *i.e.*, the railway rate, is ruled by these conditions. If a ton of coal is worth 12 francs at Lens and it is necessary to incur an expense of 4 francs to convey it to Rouen where the competition of English coal does not permit it to be sold for more than 18 francs, it is clear that the total price, toll and transport included, could only vary between 4 and 6 francs.

When the value of transport is lower than the actual cost it is inexpedient, theoretically, to make the conveyance. It would evidently be absurd to expend 4 francs to take a ton of coal into a town where it could not be sold for above 3 francs more than at the point of

production. In very special circumstances such an operation could be justified, however, and these will be described later.

The effect of competition or monopoly causes the effective price of transport to vary within the limits previously indicated, and as this depends essentially on the organisation of the services we shall next discuss these elements.

(A) *In the Case of Competition*

Where competition in transportation exists, when it is effected by independent and distinct enterprises, there is no reason why private initiative should not be permitted in the organisation of this service, either on land or water routes. Competition is in existence in practically all cases except where a monopoly has been voluntarily organised, as in the case of the Paris omnibuses.

The existence of competition is inevitable for transport which is not performed by regular services, as clients are always at liberty to have recourse to the other means of communication in the district, or, in the case of need, to call in those of another district, who will send the necessary *matériel* and personnel. Even when the facilities which can be utilised are very limited, any monopolisation is impossible on account of the means which agriculturists and industrial concerns have to enable them to perform their own transportation.

For transports coming under this category, prices naturally recede to the region of a figure which represents the minimum rate. The customers go, in fact, to whichever of the competitors offers the lowest rates Moreover, it is in the interest of each of them to attract

the competitive traffic by offering lower rates than the others, provided each ton he secures pays more than it costs to transport it. The price of such act of conveyance then necessarily approaches the additional net cost.

It is, nevertheless, necessary for the aggregate receipts of every undertaking, after having covered the additional net cost of each act of conveyance, to allow a certain profit in order to meet the general expenses, else the same would be abandoned ; but it is important to note that, in order for it to continue in existence, it is not necessary to cover the whole of the fixed charges. If it be more profitable to liquidate a business than to continue it, even when it is losing, it is necessary that the definite loss which would be incurred by the liquidation should be less than the deficit to be met if the business be continued. The definite loss, in case of liquidation, is mainly fixed capital which is not transferable to other employment when the business in which it is vested is given up.

When capital enters to a considerable extent in the working of an enterprise it will not disappear, though prices may remain so low that it does not receive any remuneration. But if the same case were presented for the part of the capital which might more profitably be employed elsewhere, it is evident that the promoters would utilise this for other purposes in order to obtain additional remuneration.

In transport undertakings realisable capital is relatively unimportant, for the plant which is not remunerative can always be utilised elsewhere. So long as a regular service is not maintained the fixed expenses independent of the traffic are very slight, as we have already explained, and the additional net cost of trans-

port is merged with the average net cost. It can therefore be said that it is the additional net cost which determines the charges actually paid, and that the distinction between additional and average net cost may be ignored.

The law of supply and demand makes the charges fluctuate round the net cost. At times of great commercial activity, means of transport are not sufficient to meet the demands and prices rise; when, on the contrary, traffic declines, carriers are content with a minimum remuneration rather than stand idle. But in the business of transport, as in all free undertakings, the balance between supply and demand tends at all times to be established by giving to the capital and to the undertaking a remuneration in proportion to the average rate of salaries and interest. As soon as this rate is exceeded, the transport undertakings become exceptionally lucrative, and the number of them increases until competition has lowered the prices; on the other hand, when enterprises cease to give receipts in proportion to their expenses, each of them curtails its facilities; some are even obliged to go into liquidation, and no new ones are formed because the capital ceases to flow into a channel which provides but small remuneration. This situation is prolonged until the diminution of the stock and materials which are no longer renewed, or the increase of the traffic, re-establishes the balance between the charge for transport and its net cost, calculated according to the cost of labour and the current rate of interest. The differences one way or the other are sometimes very considerable and prolonged, chiefly for maritime transport, by reason of the time required to increase plant when this is insufficient,

or by the demolition of old boats when they are excessive. Thus the temporary character of the differences is not maintained, and they always return to the point of equilibrium determined by the additional net cost.

The situation appears at first sight very different so far as regular services are concerned, as, in many cases, traffic can only utilise one of them. This would, therefore, appear to be a monopoly but, in reality, these services are always in competition with other undertakings which are not tied by the obligation of maintaining regularity. In connection with inland navigation regular services are quite secondary, but they are very important in maritime navigation. Even then, however, if one of them has no direct competition it is never an absolute monopoly. The public has always the choice of choosing between the various lines serving the different ports so that each line is in competition in order to serve an amount of traffic much greater than its capacity, not only with tramps but with a number of other regular services. If the postal service of St. Lazare to the Antilles or from Marseilles to Japan, for example, is unique in France, each of them is only one of the numerous means of transport by which Western Europe is connected with America or with the Far East. It is always found that competition exists between numerous free undertakings whose facilities tend to be proportioned to the necessities, under remunerative conditions.

There are established, however, as we should see if specially studying maritime navigation, certain agreements between the various lines which serve one district and these agreements bring into being quasi-

monopolies analogous to those which trusts engender to-day in so many branches of industry, *e.g.*, steel industry, sugar refinery, or petroleum. These quasi-monopolies are never equivalent to an absolute monopoly as, if they raise their charges appreciably above net cost, competitors arise and compel them to lower their charges.

It must be noticed, however, that even for regular services the case is exceptional where additional net cost differs appreciably from the average net cost of the transport. The capital necessary to establish a line of steamers is very large, but if the traffic is not sufficient to feed that line the plant does not remain appropriated to that onerous enterprise, for it can be carried to another. Except in the case of a general crisis of an exceptional duration receipts cannot remain long at a level which insufficiently remunerates the price of the plant in service without bringing about a reduction of the plant and material. The fixed times of departure of regular lines only serve a part of the traffic between the points which they connect, and the number of extra or irregular boats which have to take the rest is naturally controlled by the requirements in such a way that, on the whole, the expenses are proportional to the transport undertaken one year with another.

Thus the price of the actual transport is controlled always by the minimum rate represented by the expense that it causes and by the additional net cost which, in fact, is not appreciably distinguishable from the average net cost. Of course, the special causes which render the service more costly for the undertaking in one case than in another influence the charge. When the volume of traffic between two points differs in density on the outward and return journey it is the net cost of the

haulage of the lighter freight which serves as a basis for the calculation. Between different goods there are also some appreciable differences. The average level around which prices fluctuate is not then the same in all cases, but for actual transport this level is always controlled by the net cost of operation.

(B) *In the Case of Monopoly*

The case is quite different when a toll is concerned, as it is received independently of the price of the actual transport, as in a canal company, or when it merges as in the case of a railway. In either case, by the nature of things, he who receives the toll has always a more or less complete monopoly. This is evident when between two points there is only one means of communication. It is present in a new country where civilisation and the means of transport which accompany it are only commencing to penetrate even when there are several routes. In our countries the roads are so multiplied that the possible routes for a short journey are so numerous that by reason of this multiplicity every trace of toll has been abandoned, so much so that they need not be considered herein.

The system of railways and of navigable waterways is in quite a different position. It is much less extensive, and the traffic between the majority of the districts is not able to support more than one of these well-established ways. Moreover, as we shall see, consequent upon the enormous economy derivable, their superiority over the roads is such that the competition offered by the latter, even when exempt from every toll, exercises very rarely any appreciable influence on the railway or canal tolls ; the railways and canals thus remain, in spite of routes serving the same

places, in a situation equivalent in practice to a monopoly.

There are, however, localities connected by two routes, either rail or navigable waterway, and it would appear that in this case competition exists between the two undertakings. But the nature of things does not permit that competition to be exercised, under conditions of freedom, for it to play its usual part as a regulator of prices. The reason for this is the impossibility of conveniently proportioning the supply to the demand for transport, sometimes by an increase in the number of undertakings and sometimes by a reduction of them or their means of operation. In this way the means of communication which can be used only on payment of a toll, present very similar characteristics to the large industries which are formed into the trusts, of which we have spoken. It so follows that the competition which is attendant on these industries save under exceptional and temporary circumstances disappears entirely in the case we are now considering. We shall attempt then to elucidate the conditions which govern this ; the examples which will be given later will clarify what is a little abstract in this theoretic sketch.

The impossibility of varying the supply in proportion to the demand, by some variation in the number or means of operation of the undertakings, results from the special nature of these means of communication. The supply is constituted by the facilities for transport offered to the public by those who collect the toll. Further, in the case of canals and railways, it is only in exceptional cases that there is room for many ways. Between small places there scarcely exists sufficient traffic to support a specialised way.

When traffic is more considerable it is not the multiplication of ways made in view of a minimum traffic and costing little to construct which economically provides the means of meeting the needs, but the elimination of the steep inclines and sharp curves on the railway; the construction of double tracks to relieve the services from inconveniences incompatible with easy and rapid movement; and the lengthening or duplication of the locks on canals.

Every road set up under these conditions represents a considerable capital, and as these great arteries are multiplied, and as traffic capable of supporting several lines is exceptional, the traffic on each road proportionately diminishes. Even when the traffic between two great centres is sufficient to necessitate an increase in the lines they are not placed next door to each other. Care is taken to give them different routes in order that they may serve the greatest number of intermediate localities, and so competition only exists at the points where the lines meet. The public has then the choice between different ways or routes capable of competing only under these exceptional conditions. Even for these, the number of routes will nearly always be limited in such a way that an agreement between them will always be, if not easy, at least, possible.

On the other hand, the absence of agreement would be absolutely disastrous. This results from three facts to which we have already drawn attention: (1) that so far as the expenses incumbent on a holder of a line of communication are concerned, the additional net cost of odd traffic is totally independent of the amount of capital expended to establish the route; (2) that this additional net cost, reckoned by the

expense which each additional ton or each additional passenger causes, is infinitesimal relatively to the expenses independent of the traffic, even if account is taken of any increase in expenses which may increase the capacity of the line; and (3) that so long as an act of conveyance brings in a little more than it costs, it is an advantage to attract it by a low rate rather than not secure it. It follows, therefore, that between several routes which remain actually in competition each would have great interest in retaining any competitive traffic even if the toll had to be reduced to sush an extent that capital received scarcely any remuneration.

Thus the lowering of the tolls would proceed on each class of traffic until each of the competitors, except the one best situated for transporting the particular traffic, would have arrived at the extreme limit, when any further diminution of the toll would cause the expenses to be higher than the additional net cost. It might be that one of these routes had—from the point of view of net cost—a notable advantage over all the others, but generally, as we shall see, there are only slight differences between the expense which the carriage of one ton of merchandise occasions. Usually no route possesses such a marked superiority that it secures all the competitive traffic, each generally for certain traffic possessing a trifling advantage; for instance, the particular situation at the points for loading or unloading may be more or less favourable at certain stations or wharves. This trifling advantage would then represent the only benefit which undertakings are able to keep in a rate war between the various routes, because each road would only secure the traffic for which it has an advantage at a rate which, for

its less favoured competitors, would not cover the expense of the transport.

The insufficient remuneration of capital which would result from such a situation would not cause the disappearance of any of the competitors or a reduction in their operations, as once capital has been utilised in the creation of a line of communication it cannot be withdrawn and put to other use. It is not merely, as in the majority of industries, a considerable depreciation it would have to suffer in order to change its method or place of employment, but as the embankments, earthworks, etc., are of no use for anything if they do not serve the purpose for which they were constructed, the abandonment of the undertaking would mean a total loss. Under these conditions, neither reduction of dividends nor bankruptcy resulting from the impossibility of continuing the service, would prevent the operation of the line if the receipts covered the general administration and maintenance expenses.

Whatever be the minimum of the gross traffic which each of the lines may be able to obtain by reason of technical or geographical advantages permitting it to lower the charges more than the competing lines, it will still continue to attract the traffic by means of reduced charges, so long as they, in the aggregate, cover the expense of general administration and maintenance. It is, then, correct to say that the lack of an agreement between undertakings serving the same traffic would necessarily cause each of them to draw but an insignificant advantage from the traffic, and would lead them all to ruin if they did not find some adequate source of revenue from non-competitive traffic.

On the one hand, therefore, the large capital necessary for the establishment of a perfected road, by

limiting the number of competitors, renders an agreement always attainable. On the other hand, the impossibility of withdrawing any appreciable portion of the capital, once it has been devoted to the construction of a line of communication, proves that interest on capital has no more influence on the additional net cost of transport, and that it is to the interest of each competing company to reduce rates to the minimum, as regulated by the additional net cost, rather than lose the traffic. Such being the case, it is essential that competing lines should understand one another, and experience proves that under these circumstances agreement is the general rule.

There are, however, certain exceptions and some limitations to which we shall return in the special study of the various ways of communication. We shall see that the phenomena which are produced when lines are in competition—except that competition disappears so far as rates are concerned—still continue in connection with the speed and conditions of transport. Further, we shall see that the amalgamation of rival enterprises, or the arrangements between them for the division of traffic, have generally been preceded by a period of keen competition, more or less continuous and more or less prolonged according to the circumstances.

For the present, however, we will confine ourselves to indicating as an actual fact, in confirmation of our theoretic considerations, that monopoly, or coalition, entailing a *régime* very little different—in regard to prices at least—is the normal *régime* of railways and canals. Still there is this difference between them: that on the railways monopoly is inevitable,

since it extends to the transport, whilst on navigable ways, only applying as it does to the toll, it disappears with it if the State pays all the expenses.

The monopoly resulting from the possession of canals or railways which connect two points is not, however, the absolute monopoly of transport between these two points as, even apart from localities served by natural lines of communication, such as the sea and rivers, there always exist means of transport, across the land in primitive countries, and by roads and streets given over to public use in civilised countries. The sole advantage which owners of more perfected roads are able to offer to the public is that which corresponds to the difference between the additional net cost of transport on these ways and the net cost of similar transport by the least expensive of the other roads—natural or artificial—given over to traffic free. In reality it is on this difference alone that the monopoly rests ; but apart from the cases where the transport may be effected by sea or by large rivers not canalised, the advantage is always considerable.

Moreover, everywhere where there is a monopoly, the natural tendency of the holder of this monopoly is to get the maximum price for the service he renders, that is to say, to tax each transport according to its value. Following a celebrated formula, if the receiver of the toll fixes the price, he makes the merchandise pay all that it can bear. The differences existing between the charges imposed on certain goods are very much greater in the case of competition, for they depend on the value of the different transports, these being much more variable than the additional net cost.

If the toll be levied independently of the charge for actual transport, the owner of the line seeks to obtain the difference between the price of each transport and the maximum charge above which the traffic would not pass. He then absorbs the whole of the difference between the value of each transport and the charge for the actual transport, this being very near to the additional net cost of the operation. The toll is very high for certain transports, but it can fall almost to zero in those cases where high charges would prohibit the passing of traffic, for the supplementary expenses imposed on the owner of the line for each additional ton of traffic are almost negligible.

On railways, where the interests of public safety necessitate monopolisation of transport, as well as of the concession, the two portions of the total price mingle, but are subject to the same economic laws as a toll levied separately, the only difference being that the rate which must include the additional net cost of the actual transport cannot be reduced to the same extent as a simple toll.

As the charges for toll and transport are thus merged into the railway rate it is necessary to examine this to ascertain the influence of these elements. The rate-book of an undertaking in France, whilst fixing the maximum charges authorised, divides this legal charge into two parts, of which one (varying from a half to two-thirds of the whole) is considered as the toll, whilst the other is called the transport charge. Article 48, which provides for reductions in rates, determines that all reductions shall proportionately affect the charges for toll and transport, and this legal distinction is useful in order to fix the division of the gross charge between the companies when one of them has trains

running over the rails of another company; in that case the owners of the road over which the traffic is carried have a right to the part of the charge regarded as toll, the company working the traffic keeping the surplus.

This legal division in no way answers to the economic truth, however, as if one wishes to divide a railway rate into a toll and a transport charge, in order that these terms may have the same meaning when applied to other lines of communication, it is sufficiently near the truth to admit the simple expression that the charge for the actual transport is represented by that portion of the receipts which covers the working expenses, and the surplus has the character of a toll.

It is true that railway statistics include in working expenses the maintenance of way which, for a leased road or canal, ought to be covered by the toll. On the other hand, the working expenses of a railway do not include the interest on the capital for rolling stock, or the rent of the offices and shops, which are found in the charges of the carriers on other ways. But the plant, etc., of the railways represents about 2,500,000,000 francs, and perhaps more than 100,000,000 francs annual interest, to which it will be necessary to add the charges relative to the traffic works; and, as on the other hand, maintenance of way costs 150,000,000 francs per annum, it will be admitted that there is compensation, and that, in consequence, the expenses of operation correspond more nearly to the cost of actual transport separated, of course, from the toll.

It is not sufficient, however, to obtain the additional net cost of each transport on a railway by dividing the total working expenses by the tonnage transported; many causes influence a variation in the costs

to the carrier for a similar distance. These costs increase or decrease according to the nature of the goods and the conditions of transport, etc.; but the differences they present are much less than those in the charges collected, which sometimes vary very considerably.

The average expense incurred by a company for actual transport, say of certain goods on a particular line, is a little higher or lower, as the case may be, than the average net cost obtained in supposing an equal division of the working expenses between all the transports effected. Without being able to determine an apportionment of expenses in a definite manner, it is possible, by an attentive study, to obtain an approximate idea. After taking away this estimated expense of actual transport from the rate, the remainder has the character of a toll, destined to cover the interest of the capital and the general expenses of the undertaking, and if this remainder be nil, it is patent that low rates are in operation, and there is no amount to be apportioned for the toll. As a matter of fact, it is usual for the majority of the transports effected to be conveyed at a lower rate than the average net cost but, as we have pointed out, it is in the interest of the carrier, under certain circumstances, to attract goods by low rates when such goods could not be secured for transport at higher rates, because the additional expense to which he is subjected, considered in the light of extra tons, is but little. Here it is quite evident that the toll is almost nil, the receipts from the transport being but little higher than the additional net cost.

The considerable differences presented by railway rates are thus explained, partly by the expenses—

more or less great—which transport occasions, according to their nature and conditions, that is, by the variation in additional net cost, which is directly connected with the actual transport. Further, railway rates hold in a large measure to the fact that the possible toll varies enormously between one description of goods and another, according to commercial circumstances.

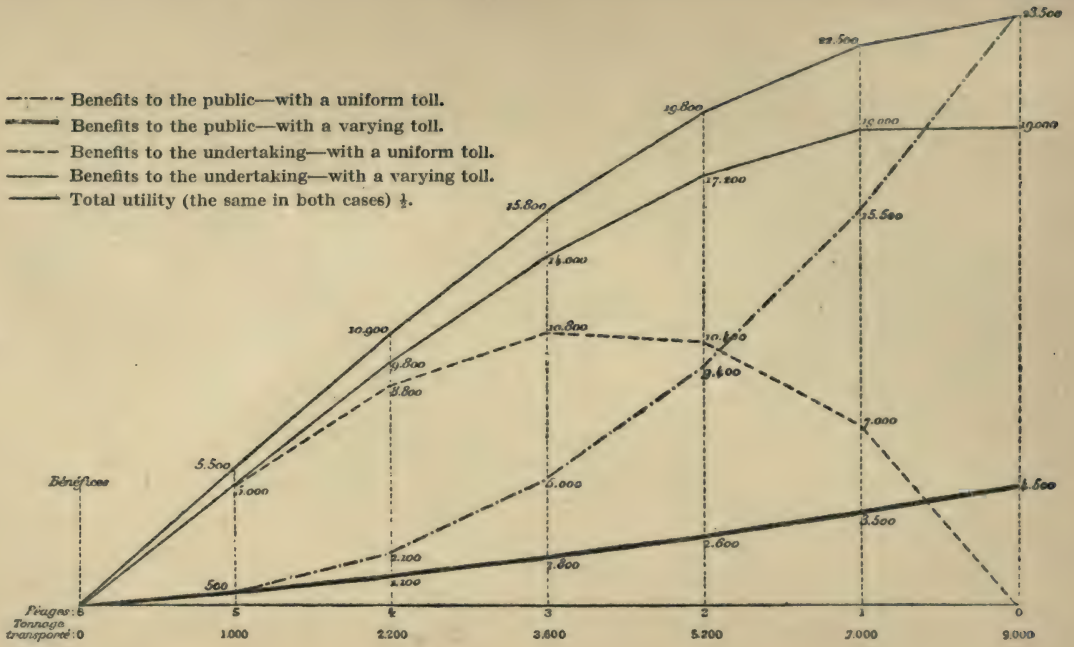
We see then that the capital originally expended for the establishment of the road does not influence the additional net cost of transport, except in so far as its value in use is concerned; it does not influence the economic conditions according to which the price fluctuates between the two limits previously discussed. This capital only interests the owner of the road, whose interest it is to attract all traffic, whether large or small in volume, which is able to pay a charge in excess of the expenses caused by the transportation, and who imposes on every transport the maximum toll it is able to bear. According to the abundance of the traffic and according to the rates that it is possible to charge, the net product will be lower or higher than the normal interest on the capital employed; this will not affect the total of the toll which the monopolist will fix in every case as the most advantageous for him.

CHAPTER V

HOW CHARGES AFFECT THE USEFULNESS OF LINES OF COMMUNICATION

THE value of the services rendered by a road can be obtained by adding two quite distinct elements—(1) the benefits which the service gives to the public, and (2) the benefits obtained by the carrier. It is obvious, *à priori*, that the importance of the service rendered by each line of communication as well as the receipts arising therefrom which are divided by the two recipients depend essentially on the tariffs in force and on the development of the traffic which is the outcome.

The remarkable works by M. Dupint, General Inspector of Bridges, have thrown considerable light on this subject, and we shall endeavour to set out the results obtained. In order to clarify the reasoning we will make some hypotheses, represented by some particular figures, as much for the tolls collected on the transports between the given points A and B as the importance of the corresponding traffic to each of these tolls. We shall try to show the results by graphic curves; the different tolls collected on goods passing from A to B will be represented by the lines, proportional to these tolls, measured horizontally, and the benefits, obtained under different hypotheses, by vertical lines. The different curves will indicate, both in the case of uniform and variable tolls, the law


Benefits to the public—with a uniform toll.
Benefits to the public—with a varying toll.
Benefits to the undertaking—with a uniform toll.
Benefits to the undertaking—with a varying toll.
Total utility (the same in both cases) ½.
Bénéfices
Fr. 23.500
22.500
19.800
19.000
19.000
17.100
15.800
15.500
14.000
10.900
10.800
10.100
9.800
9.400
9.800
7.000
5.500
5.000
4.800
3.500
2.600
2.100
2.100
1.800
1.000
500
Fr. 5
4
3
2
1
0
Tonnage transporté: 0
1.000
2.200
3.800
5.200
7.000
9.000

of variation of benefits to the public on the one hand, and of those of the carrier on the other.

In the valuation of the benefits of the carrier we shall admit, for the sake of more simplicity, that these benefits are represented by the gross receipts, neglecting the small influence of the frequency of service on the maintenance expenses. The total advantage obtained by the whole of those interested in the means of communication, in each hypothesis, is calculated by the total receipts of the undertaking and the benefits accruing to the public, and in this study we shall term this sum the " total utility " and show the same by a special curve.

Let us suppose that the figure of 6 francs represents the highest limit of the surplus of the value of the transport which could be obtained over the total net cost of the transport. There would then be no interest in transporting from A to B goods which could only pay 6 francs and this toll would correspond to nil traffic. Let us further suppose that by lowering the toll to 5 francs, 1000 tons of traffic pass. This means that 1000 tons of goods, clothes, expensive furniture, etc., exist for which the excess of the value of transport over its net cost is between 5 and 6 francs. By paying a toll of 5 francs the public still obtains a varying benefit, between 0 and 1 franc per ton—say, on an average, 50 centimes—on the different consignments, and for the total, on 1000 tons, 500 francs gain. The carrier gets 5,000 francs in receipts, and the gain of the carrier and the public together is 5,500 francs.

If the rate be lowered, traffic will increase, and in almost every instance, if successive equal reductions are considered, each of these will produce a larger increase in traffic than the previous reduction. It is really a

general economic law, confirmed by observation, that when lowering of charges renders an object of service accessible to a new set of buyers, any subsequent reductions will enhance the tendency. The more prices are reduced, the more numerous are the consumers to profit by the reductions.

In order to explain this law we shall take as our example figures corresponding to an increase of traffic which is always growing. A reduction in the toll of 1 franc might augment the traffic from 1000 tons to 2,200 tons, and this would prove that there exist 1,200 tons of goods, machinery and material which are able to bear a toll of 4 francs but not 5; the surplus of the value of the transport of these goods above their net cost is, therefore, comprised between 5 and 4 francs. The public by paying 4 francs will still realise a gain of between 0 and 1 franc per ton—50 centimes per ton on the average, or 600 francs on the whole. If the toll be uniformly fixed at 4 francs the public, with the 1000 tons which were transported formerly at 5 francs per ton and which now only pay 4 francs per ton, realises an additional profit of 1000 francs. By adding this 1000 francs to the 500 francs already gained over the transport of the 1000 tons at 5 francs, together with the 600 francs gained on the new traffic, it is clear that the public, under a uniform tariff of 4 francs, draws a benefit of 2,100 francs from the use of the road. The owner of the road, on his side, receives 4 francs per ton on 2,200 tons, *i.e.*, 8,800 francs, and so the total of the combined gain is 10,900 francs. The reduction in the rate has, therefore, been simultaneously favourable to all interests.

Let us further suppose that a new reduction of 1 franc brings an increase of 1,400 tons of goods, such as

woollens and cottons, which are able to pay 3 francs but could not pay 4. Reasoning from our previous standpoint, it will be seen that the average profit of 50 centimes per ton obtained on the new traffic, added to the profit (2,100 francs) obtained from the carriage of the previous traffic, as mentioned above, also the sum of 1 franc per ton gained by the reduction from 4 francs to 3 francs, being made a general reduction, represents 5,000 francs gain to the public, the undertaking obtaining 3 francs × 3,600 = 10,800 francs. There is still a gain to the public, and the total benefit to the public and the undertaking amounts to 15,800 francs.

Let us apply the same reasoning to a further reduction of 1 franc, which attracts additional traffic, *e.g.*, wines, wheat, timber, etc., to the amount of 1,600 tons, and we shall see that the public will continue to gain, on the one hand, by the increase in the quantity of merchandise passing on the railway, and, on the other hand, by the reductions in the tariff applying to the merchandise which was already making use of the road. The calculation shows that the public gain to the extent of 9,400 francs, but the undertaking does not receive more than 2 francs × 5,200 = 10,400 francs, thus the reduction in the charges, whilst developing the traffic, commences to cause the undertaking to lose more than it gains. The total utility of the road, on the contrary, goes on increasing and is reckoned at 19,800 francs.

If we suppose that, in reducing the rate uniformly to 1 franc, new traffic is attracted, such as coal, stone, etc., the benefits of the public continue to increase, and if the additional traffic be 1,800 tons the public would gain altogether 15,500 francs, but the undertaking would get but 1 franc per ton on a total traffic of

7,000 tons, and would, in consequence, be working at considerable loss of gross receipts.

If, in order to attract a further 2,000 tons of goods of little value, which cannot pay the toll of 1 franc, such as minerals and manures, the toll is entirely obscured, the receipts of the undertaking would be nil. As regards the public, it would gain 1 franc more per ton on the last-mentioned reduction and an average of 50 centimes on the last 2,000 tons, for which the value of the transport is higher than the net cost without, however, the difference reaching 1 franc, since the toll of 1 franc, when it did exist, prevented the carriage of the goods. The public gain then reaches 23,500 francs in all. The total utility of the road, which is not composed of more than this single element, since there is no longer any toll paid, thus reaches this highest figure.

The result is, if the toll be uniform, the interests of the carrier and the public are identical up to a point should there be a reduction in the toll. But this accord ceases when the reduction brings in traffic which gives the maximum receipts to the undertaking. From this point, any further reduction is favourable to the public interest, as it increases the services rendered by the railway, but it constitutes a sacrifice on the part of the undertaking. At last—if the argument be carried to a logical conclusion—in order to obtain the maximum utilisation of the road, it is necessary to suppress the toll completely, since this allows all commodities worth more than they cost to be transported. In this case, however, there is no remuneration for the establishment capital.

We must now consider the circumstances where varying tolls are established, such as 5 francs on articles of luxury, 4 francs on fabrics and machinery,

3 francs on cotton and wool, 2 francs on corn, wines and timber, 1 franc on stone and coal, and one might exempt minerals and manures from any toll whatsoever. Each merchandise thus being rated according to the charges it can bear, it will be to the interest of the public to send the whole of the traffic for which the charges, were they under a uniform toll, would be too high, unless such toll tended to zero.

What will be the profit realised by the public, on the one hand, and the undertaking, on the other, when there is a series of decreasing tariffs, *i.e.*, 5 francs, 4 francs, 3 francs, etc. ? It was shown above that the gradual reduction from 6 francs to 3 francs would bring 3,600 tons of goods to be transported. For each of these tons the surplus of the value of the transport over its net cost lies between the rate which has made the transport possible, and the rate increased by 1 franc under which, according to our hypothesis, the transport is impossible. The benefit of the public, between 0 and 1 franc for each ton, is, on an average, 50 centimes per ton, whilst the advantages which the public draws from the means of transport go on rising as new tariffs are created, but they rise much less quickly than at first since they are never but 50 centimes multiplied by the total tonnage.

The gains to the undertaking rise equally in a continuous manner, because by creating a tariff of 4 francs for cotton and wool there is added to the 5,000 francs collected on the manufactured articles paying 5 francs 4 francs $\times$ 1,200 = 4,800 francs on the new goods transported, and the creation of the 3 franc tariff, without implying any sacrifice on the traffic acquired at 5 francs and 4 francs, adds still 3 francs $\times$ 1,400 = 4,200 francs to the receipts. The interests of the under-

taking are, then, in harmony with those of the public so far as the creation of reduced tariffs permits the transport of additional commodities. Even the complete abatement accorded to the last class of goods, if it does not bring in anything to the undertaking, is not onerous, since it attracts traffic which cannot pay any toll, without necessitating the abandonment of any portion of the acquired receipts.

If, as above, we seek for a measure of the total utility of the road, after the creation of each new reduced tariff, on adding the benefits of the public and the receipts of the undertaking, we shall arrive at exactly the same figures as in our earlier proposition in regard to the *tarif unique* (uniform rate). With the three tolls of 5, 4, and 3 francs, for instance, the total benefit is about 15,800 francs just as with the uniform rate of 3 francs. It is easy, therefore, to understand that the total utility of the road may be exactly the same in the two cases, since it serves for the same traffic. But the distribution of the benefit is very different. In the first case the undertaking would gain 10,800 francs, and the public, 5,000 francs, whilst, in the second event, the public does not gain more than 1,800 francs and the undertaking 14,000 francs.

The only difference between the two methods is that, with the uniform toll, the undertaking could only secure new traffic by reducing the previous rate on the traffic already acquired, whilst with the variable toll, it can retain this rate entirely.

This analysis shows that if high tariffs prevent means of communication from rendering all the service they can render, it is not by reason of the sum charged on the traffic which actually passes but because of the hindrance the toll puts in the way of traffic, the value of which

is barely above the net cost, and which, if carried at the high tariff, could not give a profit. It follows then that the modifications of the tariff applied to merchandise influence the distribution between the public and the undertaking without influencing the total utility, but when a toll which is too high renders transport impossible there is a clear loss on all hands, a decrease in the services rendered by the undertaking without a gain to anyone.

From this it is clear that every obstacle put in the way of lowering the tariff which is necessary in order to develop a traffic which cannot exist without the reduction is, in itself, bad—absolutely bad—if one looks at transport solely; but there could be some question of international politics involved which might lead a government to place obstacles, in the shape of high tariffs, to the economically useful transport of certain commodities.

On the contrary, the measures, which favour or prevent the lowering or raising again of tariffs within the limits wherein such tariffs do not hinder the traffic, do not influence the creation of wealth, and only react on its distribution between the undertaking and the users of the road. This distribution cannot be considered as indifferent, and we shall return later on to that phase of the subject. For the present, however, we may notice that it is better to allow an unequal distribution of the benefit than to suppress it altogether. Thus, when one cannot calculate or apply exactly the charge which goods can bear it is in the general interest to charge too low rather than too high.

CHAPTER VI

INFERENCES TO BE DRAWN FROM THE PRECEDING CONSIDERATIONS IN REGARD TO THE FIXING OF TARIFFS

THE foregoing observations show that it is theoretically necessary, in order to obtain all the possible benefit without reducing the services rendered, to make each commodity pay as much as it can pay without, however, asking it to pay more than it is able. But in practice, the determination of the toll which merchandise can bear is a matter of estimate, and as into this estimate so many diverse elements enter one has to consider the majority of cases, to avoid purely arbitrary decisions. It is, however, of importance in discussing the general rules applicable in the majority of cases to point out that special tariffs must be charged where circumstances necessitate them, and it is from the necessity of reconciling these two points of view that the question of tariffs becomes a difficult one.

Necessity of General Rules

Reverting for a moment to the question of transport between two given points, A and B, where we supposed that the tolls which the traffic between these two points was able to bear decreased as the products decreased in value. This, however, although generally so, is not an absolute rule. Local circumstances, for instance, may cause the value of transport between two

points to be greater for cheap goods than for dear goods. Identical commodities may be used for a different purpose in one place than another, so the value will vary, and, therefore, the toll which each transport can bear differs according to circumstances. Similarly, when regarding different distances, one observes that the value of transport generally grows with the distance, but that this rule, as the preceding one, is subject to numerous exceptions. The difference which the volume of traffic presents is often less between two markets very distant than between two markets much nearer to one another, with the result that the maximum price which the traffic can bear is not proportionate to the distance covered.

Thus, when comparing the transport from A to B, which are 500 kilometres apart, with the transport from A to C, also 500 kilometres apart but in another direction, not only might the tolls be found to differ on similar commodities transported from A to B, and A to C, but it would perhaps be found that goods paying a high charge between A and B could only be conveyed at a low rate between A and C, or *vice versa*. If we take a third town D, situated 800 kilometres from A, there will be some goods from A to D, which cannot pay rates as high as those from A to B or C, whilst other goods which are able usually to bear higher rates will be put to special uses in D only if they are called on to pay a low rate.

The commercial conditions of traffic generally establish the rates, but the price varies according to circumstances, not only the nature of the goods and the value of the transport, but the future uses of each consignment having to be considered. The law of variation would never be the same between all points,

so that it would be commercial honesty to fix a special and definite charge for each and every consignment.

If the very numerous elements which have an influence on the fixing of charges were ascertainable by mathematical calculation, each kind could be taken into account without great inconvenience. The complications of the tariff would be extreme, but its equity could, at least, be demonstrated. Unfortunately, the commercial conditions on which the decisions are based can be regarded from different points of view even by enlightened and impartial persons. When two managers of commercial undertakings each in turn meet a railway manager and endeavour to prove to him that a reduction in rates would develop certain traffic which cannot pass under existing conditions, it might happen that the first endeavours to convince the railway manager that the concession would result in substantial future gain to the railway company, whilst the second might allow that the reduction would be a sacrifice by the company. Such arguments might influence another person in quite a different manner. It is, therefore, very difficult to distinguish between an equitable and an arbitrary estimate.

In order to prevent any arbitrary treatment, apparent or real, railway legislation in all countries under various forms forbids inequality of treatment and requires that rates applied to particular merchandise between two given stations shall be the same to all consignors who accept like conditions of transport. But the application of this principle does not prevent the complexity of tariffs. The number of possible rates between various stations of one system, and of

goods which may be conveyed, is considerable. Competition is not carried on merely between the traders who consign like produce on the same piece of road but between all industries dealing with goods that may be used as substitutes or alternatives. This competition depends on the relative amount of the rates within a vast radius quite as much in connection with the supply of raw material as for the consignments of manufactured goods. For a price to be equitable, a certain harmony must exist in the determination of the rate, Tariffs must be fixed according to general rules applicable to all traffic and all deviations must be fully justified.

Classification and Conditions of Transport

In order to allow for these differences, so far as goods are concerned, a classification is established, this dividing all commodities into a certain number of groups or series, the position of the commodities in the groups being determined—in the majority of cases—by the rate they are probably able to bear; that is to say, according to a series of considerations in which the value of the goods plays the principal part. But we have seen that the value of the transportation does not solely depend on the nature of the goods. It becomes necessary then to make allowances in the tariffs proportionate to the differences in the consignments. The importance of the consignments, their method of packing, etc., often give valuable indications as to this, and as a result the same goods are often classified under different heads in accordance with the conditions under which they are consigned. In France, special tariffs are those which give price reductions subject to conditions of this character.

These conditions, whilst furnishing some evidence as to the value of the consignment, often justify a reduction in price, *i.e.*, because the packing causes less handling of the goods and so lowers the expenses of the carrier. Those which concern the celerity of transport or the liability of the carrier are extremely important from this point of view. In addition, they are important as they reveal the quality of the different manufactured goods comprised in the same denomination. By subordinating certain differences of price to the differences in conditions of speed, or of liability, the consignors are made to establish a distinction between goods bearing the same name but of different quality.

It is a system analogous to the one adopted for passengers. They are offered different classes of carriages between which they may choose for themselves, according to whether their wealth permits them to pay a higher fare for increased comfort or not. Other differences of price are subordinated to the character of the traveller (student, workman, etc.), or to the conditions of the journey (single or return, season ticket, excursion train, etc.).

In order to establish general rules, formulæ must be adopted which permit of the rates between any two stations being calculated by means of a scale as a function of the distance. For each group of goods or of passengers such a scale must be drawn up, this being higher or lower in accordance with the ability of the particular group to pay the charges. In order that the prices obtained from mathematical formulæ, however, may be capable of application to the majority of the traffic without hindering the development, and by deriving from each unit a

return as near as is possible to its value, there must be many scales of varying types, each applying to particular circumstances. The basis of a scale is taken to be the price paid for each ton of merchandise or each passenger carried one kilometre. Ton- and passenger-kilometres are then generally taken as the units; the most exact method of calculating the importance of a traffic is, in reality, to multiply the weight or the number of heads carried by the length of the journey and by considering as equivalent the transport of one ton 100 kilometres and 100 tons one kilometre.

Scales and their Graphic Representation.

The best means of comparing scales is by a graphic representation of them. Lengths proportional to the distances are measured on the horizontal, and the lengths of the perpendiculars are made proportionate to the corresponding charges. The line which joins them represents the rates according to a scale, and the divergence between the lines shows the difference between the charges of different scales at varying distances. The following figure indicates how the varying types of scales in use in France are represented.

The first system, and the most simple, consists of fixing the charges proportional to the distance, and adding a constant sum for terminal charges, this being the term given to charges made at the departure and arrival points, which consist principally, from the point of view of the actual transport, of charges for loading and unloading, and, from the point of view of the toll, the rent of sites necessary for their performance. The line indicating the tariff

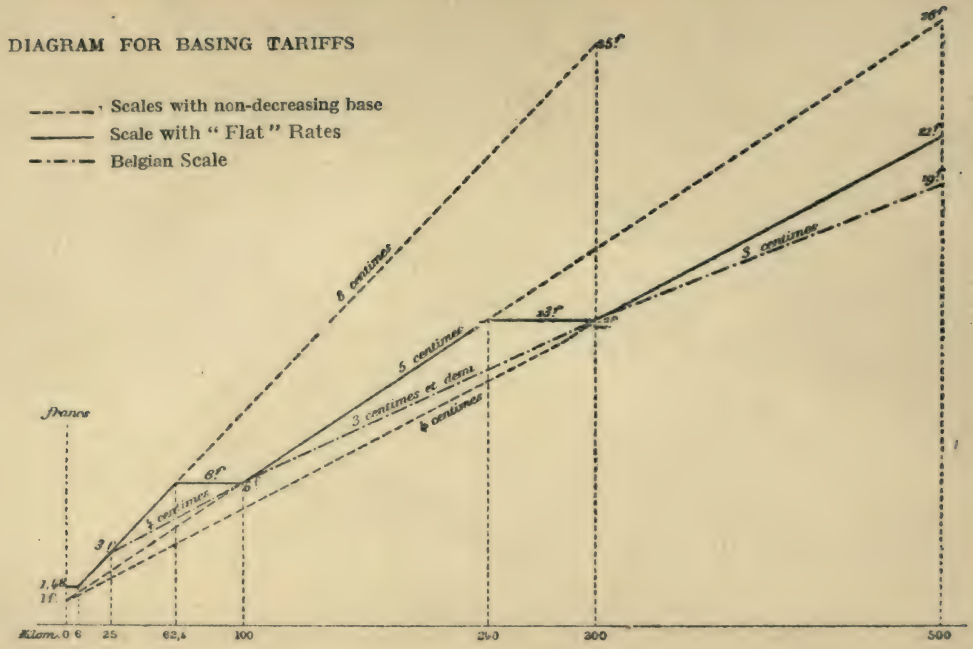


DIAGRAM FOR BASING TARIFFS
Scales with non-decreasing base
Scale with "Flat" Rates
Belgian Scale
8 centimes
5 centimes
3 centimes et demi
3 centimes
5 centimes
Francs
Kilom. 0 6 25 62,5 100 200 300 500

in this case is a straight line more or less inclined as the kilometric scale is more or less reduced and detaching itself from the vertical line, at the point which corresponds to the departure point, at a height representing terminal charges.

For long distances, however, the charges are so high that, were they applied, transport would become impossible, especially for merchandise of little value, and it is necessary to adopt a system in which the base may decrease as the distance increases. This system, besides, is much more logical as the net cost per kilometre is always less for long distance traffic than for short distance traffic by reason of the better utilisation of the plant, equipment and personnel.

An example of the first type of tariffs, with decreasing base, is found in the general tariff which has been in use for some time on the French railways for coal and other minerals of little value. The terminal charge for large consignments is 1 franc. The charge proportional to the distance was fixed at 8 centimes per ton per kilometre up to 100 kilometres, and 5 centimes for distance between 100 and 300 kilometres, and 4 centimes for distance higher than 300 kilometres. There were, therefore, three tariffs whose base went on decreasing in accordance with the distance. But if this formula had been applied there would have been a singular result as the charge for 99 kilometres would have been—terminal charges included—1 franc + 8 centimes × 99 kilometres = 8 fr. 92 centimes, and for 101 kilometres, 1 franc + 5 centimes × 101 = 6 fr. 05 centimes only. It was necessary, therefore, to eradicate this anomaly, so it was consequently decided that the total charge should never exceed, for distances below 100 kilometres, 6 francs.* A passage

from one base to another was then made (see diagram) by applying the special " flat " charge of 6 francs from the distance of 62 kilometres (the point at which the price corresponded with the base of 8 centimes) to the point at which the following base commenced to operate.

The passage from the base of 5 centimes to that of 4 centimes was made in a similar manner, as a " flat " charge of 13 francs per ton was applied to all traffic passing between 240 and 300 kilometres. Tariffs of this nature are represented graphically by straight lines inclined differently, these lines being broken by certain horizontal lines which represent the points between which a " flat " charge is in operation. (See diagram.)

In order that this difficulty might be avoided, a formula—first put into systematic use by the Belgian Railway Administration and thus receiving its name of *Barême belge*—has been adopted. This, instead of multiplying the total of the distance by a single kilometric base, which decreases as the distance grows (*Barême à paliers*), applies the first principles of a kilometric base, but differs essentially from the other system in that its charges are graded in accordance with distance, *i.e.*, reduced charges apply after a certain distance has been traversed.

Let the tariff generally applied on coal by all the French railways be taken as an illustration. The old charge of 8 centimes applies for the first 25 kilometres, and thus for a haul of the full distance a price of 3 francs—which includes terminals—is charged. Each additional kilometre, after the first 25, is then charged 4 centimes, this rate applying to a distance of 100 kilometres. For a haul of this distance the charge

would thus be 1 franc + 8 centimes × 25 + 4 centimes × 75 = 6 francs. From this point, that is, after the 100 kilometres have been traversed, the rate for each additional kilometre is 3·5 centimes up to 300 kilometres, at which distance the charge would be 1 franc + 8 centimes × 25 + 4 centimes × 75 + 3·5 centimes × 200 = 13 francs. Beyond this distance the base is further reduced, first to 3 centimes—between 300 and 600 kilometres—then to 2·5 centimes for the remainder of the distance.

Tariffs thus calculated are represented by broken lines which, however, never become horizontal, as in the case of the *Barême à paliers*. They represent a total price which increases with the distance, but in disproportionate ratio. The distances at which the decreased rates begin to apply can be so arranged as to cover many varied types of traffic, and it is this type of scale which is most used for goods traffic by the French railways.

Special Rates

In addition to the previously formulated general rules it is necessary to establish rates having sufficient flexibility to respond to commercial necessities wherever the need for them arises. Where certain goods have to be conveyed between given stations, under particular circumstances, at a different price to that which results from the application of the general tariff, an exception is established and what is termed a special rate adopted.

In practice, the circumstances which justify the adoption of special rates can, in almost all cases, be divided under three heads. The first is, where there exists another undertaking transporting goods between

the particular places at rates below the general scale. For example, if from A to B there exists a means of transporting goods in as great a quantity as desired, and with sufficient speed, at a cost of 5 francs, these goods will never be worth above 5 francs more at B than at A; and so a competing undertaking could not obtain any of the traffic if its rate were higher than 5 francs, even though its rate of 5 francs were much lower than similar rates on other parts of its system. It is especially in cases of competition that special rates have an appreciable bearing on receipts, because if one road is appreciably cheaper than the other, the traffic will favour the former almost entirely.

The second case is that where a centre of consumption A can be provided with a similar class of goods from several centres of production, B, C and D. In this case a reduction in the price of transport between (say) B and A might enable B, by placing such a quantity of goods on the market A, to oust—either partially or wholly—the products of C and D, whereas, if the schedule rates prevailed the market might be closed to it. Again, a special rate often gives an increase of traffic which is very lucrative to the transport undertaking. The inverse case, that where a particular centre of production could sell its products in different centres of consumption, might be considered but, in practice, it merges with the third case, as we will soon show.

The third case is that where a reduction in the rate will considerably develop traffic, not by the elimination of competitors, but by increasing the amount of exchange. This is often the case with heavy merchandise, where the cost of transport plays an important part in the selling price. For example,

a reduction in the transport charge for coal in a particular district might bring an increase of traffic more than proportional to that resulting from a similar reduction in another district. There are many cases where, owing to special circumstances, the application of a special rate will so develop traffic that the transport undertaking will be amply repaid for its speculative sacrifice. There are, however, other cases where the same reduction might be far from giving analogous results.

It must here be specially recognised that in the last of these three cases the effect of reducing rates is most uncertain, as it is a question, not of displacing an existing traffic—the importance and conditions of which are known—but of creating an entirely new traffic, the development of which must be subject to a large number of contingent influences.

In the first of the three cases we have just enumerated the interests of the transport undertakings competing for the traffic are primarily concerned ; in the second, the output of the producers depends largely on the rates, and the competition that well-considered rate reductions brings into being indirectly profits the consumers ; whilst, in the third case, the interests of the consumers, including the manufacturers employing raw materials, etc., are chiefly concerned. Rate reductions, therefore, always interest certain classes of the public.

It is sometimes said that the special rates constitute an arbitrary favour to those who profit by them. When they are brought about by the competition of another transport undertaking they add but little to the advantages due to the existence of the second undertaking. In the two other instances, the public get a certain

advantage from them. But from the moment that a special rate is controlled by commercial circumstances, it constitutes in no way an arbitrary inequality of treatment between different districts.

The following objection is often raised against special rates:—If a company finds it to its interest to lower the price of transport between any two towns to 5 francs per 100 kilometres in order to bring a proportionate profit, it is exorbitant to charge 10 francs between two other stations the same distance apart. This is utterly false reasoning, however, for the fact that a particular traffic at a reduced rate gives a profit does not prove that there would be equal profit on all other traffic. A sound tariff system must fulfil two conditions: (1) It must not prevent the carriage of any traffic capable of giving a return above its own carrying cost; and (2) It must give on the whole a surplus of receipts over the costs of operation so as to pay interest on the capital. From the fact that an undertaking considers it advisable to attract, at a reduced rate, consignments which give but a small profit it should not be concluded that an equal profit on the other elements of traffic would give a fair remuneration.

It is still more false to say, as is sometimes said, that, if an average receipt of 6 centimes per ton per kilometre is necessary for a company to meet its charges, it is necessary, when it accepts traffic at 4 centimes, for it to tax certain consignments at 8 centimes. What is necessary for a company is not an average receipt of so much per ton; but a total receipt which exceeds the expenses of operation by a sum sufficient to pay the interest on the capital If a reduction be made it is certainly necessary to find compensation somewhere. But if one carries goods at a reduced price for the simple

reason that it would not be possible to get more for the carriage, and that it is better to carry them at this low price rather than not carry them at all, there is no sacrifice, and, therefore, no compensation is required. There is, on the other hand, an element of additional profit. On this hypothesis, where the entire amount of the fixed charges would previously have been distributed over a smaller volume of traffic, the reduction in rate which attracts the additional traffic, far from compelling an extra charge on the rest, contributes to a reduction of their charge, inasmuch as the traffic gained, after clearing operating expenses, contributes something—however small it may be—to the remuneration of capital.

Special rates have then neither the character of an arbitrary favour, nor that of an injustice, when they are brought about either by competition or the value of the transport; they constitute a gain and not a charge to the whole of the traffic so long as they remain higher than the additional net cost of carriage.

Circumstances which justify the Predominance of Scales or of Special Rates in a Tariff System

All tariff systems in practice contain both ordinary and special rates. Ordinary rates alone could not meet all commercial necessities; but if special rates only were in force, there would be inextricable complication and much injustice from the difficulty of application. The question, however, as to which of the two methods of charging should be applied to the larger proportion of the traffic, in what proportion and within what areas has been the cause of lengthy disputes, and the intervention of public authorities in all parts of the world.

It should be noticed, at the beginning, that all debate on this subject is dominated by a preliminary question ; that of knowing what return is necessary from a line. We have seen that in order to attract to a line all the receipts possible without lessening its utility, it is necessary to apply, as far as possible, tariffs which take into consideration the value of each act of conveyance. Moreover, it must be made clear that whilst the capital absorbed in the construction of railways exercises no influence on the fixing of individual rates, it can exercise a considerable influence on the general line of conduct pursued in the matter of rates.

Without doubt, the direct interest of the directors of each company, be it State or company owned, is always to draw from the traffic the maximum receipts. But this maximum can only be reached by a tariff system admitting considerable inequalities. To suppress these inequalities would prevent reductions in rates and render impossible the transport of certain classes of traffic, whilst the services rendered by the lines of communication would be diminished without profit to any one. It is impossible then to eliminate these inequalities and extend the reductions, necessary for the development of certain traffic, to other traffic which can bear higher rates, as this would mean the gratuitous surrender of part of the receipts. Such a course, possible once capital is suitably remunerated, would be absurd when it is not so, and when it would be necessary to impose a loss on those responsible for the enterprise. It can, indeed, be questioned whether the reduction of the highest charges to the level of the lowest would be equitable, even when the interest on capital is covered. Some very strong objections can be formulated to this course.

When the railways belong to the State it appears quite legitimate to continue to make each consignment of goods and each passenger pay all they can bear, even when the receipts would greatly exceed the expenses, since, in this case, the profits realised permit the public burden to be lightened. From the moment when an intelligent tariff system does not stop any useful transport, would it not be rational for the State to make each of them pay the integral value of the service, much more so than burdening commerce and industry with heavy taxes, in order to balance its receipts and expenses? To make the lines of communication a source of net profit, to the advantage of the Budget, would not be irrational, if this could be realised without the utility of the undertakings being diminished.

Is the position the same when the lines are company owned? These undertake the enterprise voluntarily, and contend that, from the moment when they do not stop any useful transport, nothing justifies any measures prohibiting them from obtaining all possible revenue. Doubtless it is just to allow them a sufficient remuneration for their enterprise. They have risked their capital in it, and could not know beforehand whether the traffic would permit of their obtaining a reasonable profit on their investment. It is fair, then, that if the undertaking be well conceived and well managed it brings them good profits.

It is necessary, however, to remember that this profit results from a monopoly conferred by the public authorities. The Government, which could allow other companies to enter into the participation of this monopoly by creating new lines parallel to the prosperous one, does not commit any iniquity by using its power to compel the company working the existing

lines to give up part of their profits to the public, when such profits are very high. This limitation of profits is more justifiable as the risk is less. A company which enjoys a guarantee of interest is less justified in claiming to dispose in its own way of any excessive receipts than one which has undertaken all the risks.

In such cases, then, the companies are obliged either to share their surplus with the State, or to use it in the construction of new lines, or by making reductions in rates which are not really necessitated by traffic conditions. In giving this surplus of profit to either of these three branches of the public interest, the companies are prevented from obtaining excessive profits. In order to effect this, it is usual in many countries for the Concession Acts to stipulate, when the dividend is higher than 6, 8 or 10 per cent. (sometimes 15 per cent. in the Colonies), for a share in the profits or reductions in rates. In France, any excess of profits has been applied to the construction of new lines.

When, on the contrary, a company has great difficulty in covering its expenses, it is not desirable that it should be refused facilities for obtaining interest on capital; in other words, it should be permitted to have varying tariffs so as to make the traffic pay all it can bear, and, providing this does not prevent any transport, it does not prejudice the public interest. If a guarantee of interest safeguards the shareholders from any loss consequent on the insufficiency of receipts, any State regulation prohibiting increased tariffs, etc., would not have the same character of injustice to the company. It is true that in certain cases the profits resulting from transport at reduced charges compensate for the initial sacrifice, but these cases are less

frequent than are generally supposed. Some particular circumstances are necessary, in order that there may be a public interest, either in exonerating merchandise from paying charges which it can pay, or in effecting transports whose value is less than the net cost. Thus we arrive at the conclusion that tariffs calculated to yield the highest possible revenue cannot be criticised except where they act disadvantageously to the public interest.

We have then a precise account as to what constitutes the public interest in the question of tariffs. In Germany, and in other countries, where it has been the policy to purchase the railways, the making of tariffs in the public interest is favoured as against rating in the private interest. A close analysis shows that, in the majority of cases, tariffs are only contrary to the public interest when, under the pretext of uniformity, the price prevents useful transport. Thus, on an ably administered line, the most lucrative toll is not opposed to that line rendering the public its due service, and the true interests of the public are not so concerned with the extent of the receipts as with the appropriation of any surplus to the public interest.

In order to obtain from a line of communication all the possible receipts, without burdening any particular transport, the use of special rates is indispensable. They alone allow tariffs to be reduced without necessitating a general reduction which always entails certain losses, for among rates reduced *en bloc* there are always some which need not have been reduced. It is easy to criticise the anomalies entailed in charges deviating from the mathematical formulæ ; but it is impossible to establish, without special rates, a tariff system which

may be remunerative without burdening the traffic. To reduce all the tolls to the minimum rate, which one is obliged to accept in some cases, would be to give up obtaining any interest on the capital sunk in building the railways, as under such conditions the tolls fall to almost nothing. On the other hand, to prohibit the reduction of a given toll to below the mean figure calculated to give a legitimate remuneration to the capital invested, would be to interfere arbitrarily and without advantage to anybody with the utility of the railway, as it would render impossible the conveyance of traffic which could not pay the mean rate but which could pay more than the carriage would cost.

It must then be admitted that special rates are quite justified. In order to obtain, in support of each of them, sufficient justification, it is essential to make them the exception and not the rule, but the exception must be admitted without hesitation when the necessity is recognised. This necessity exists in all cases where the application of general schedules would only permit the transport of commodities able to pay the schedule charges ; where the toll would be raised to such a figure that the traffic could not pay it. So that these cases may not be too frequent, however, and special rates become the rule instead of the exception, schedules must be established so that the traffic which can pay its due charges will do so.

It is when the receipts substantially exceed the costs that a company is required to effect the reductions necessary to the development of traffic by reduced scales, applicable simultaneously to all consignments, instead of limiting the reductions by special rates to certain consignments which could not bear high

rates. The more prosperous a system is, the easier it becomes to simplify the tariffs by lowering the scale in such a way that special rates, yet lower, may be but rarely necessary. From which one can deduce that, in general, the system of tariff making where scales predominate must be that of rich lines, and the system of tariffs containing numerous special rates that of lines which only cover their costs with difficulty.

The policy which the public authorities should follow in the question of rate-making thus depends to a certain extent on the relation existing between the importance of the traffic and the sum total of the capital previously expended for the establishment of the road. This does not imply that they must always reduce the rates from the time that these give receipts in excess of the charges, and still less that they are able, by whatever mode of rate-making, to prevent the deficit if the elements of traffic are not sufficient to cover the charges. But according as the traffic tends to give deficits or surpluses, it is convenient to allow more or less liberty to the undertaking, so that the rates may be varied in response to commercial circumstances.

In all these cases, this liberty will have, as a consequence, the establishment of more or less numerous special rates since their use cannot be completely abandoned without extreme inconvenience. It would then be altogether unreasonable not to permit special rates, and arbitrariness in their establishment should be alone condemned. But it is difficult to have any guarantee in this respect if one allows to undertakings a discretionary power in the estimation—sometimes so delicate—of circumstances which justify certain tariffs, on which may depend the prosperity and, in some

cases, the very existence of industries and commercial centres, as well as the price of primary necessaries.

It follows, therefore, that the principles we have discussed are not able, by themselves, to furnish a solution of the difficulties which the question of transport prices presents. They must, in practice, be combined with the study of circumstances and facts alien to transport itself, in order to inspire a wise policy in the matter of tariffs. It is possible for a railway company to be disposed to effect certain transportation at a temporary loss, in such a case, for example, as where the ruin of an industry is otherwise possible. Public opinion, certain situations, sometimes political interests, or the necessity of assisting the population of a district to get over certain crises, almost always restrain the liberty which economic conditions would allow to the State or to its *concessionnaires* in connection with tariffs.

No more in political economy than in mechanics does the rough application of a simple law permit of the determination of practical difficulties. The study of principles is not less indispensable in questions of this kind. Certain conditions can sometimes establish prices which would be little justified if they were regarded from the particular standpoint of transport alone ; it is not less necessary to know the difference from the ordinary rules in fixing them in order to compare at any time the importance of the motives which justify these exceptional measures.

PART II

RAILWAY RATES IN FRANCE

CHAPTER I

CHARACTERISTICS OF THE TARIFFS

THE study of railway transport we have previously made indicates clearly that, both from the legal and economic points of view, the conditions under which rates are established for traffic conveyed by rail differ absolutely from those operative in other modes of transport. From the legal point of view, rates are no longer fixed freely for any particular transport but, instead, tariffs are established for each category of traffic according to definite rules which must strictly be applied, and which can be modified only by agreement between the companies and the administration. From the economic point of view, transport is no longer effected by numerous enterprises competing with each other as to facilities and regulating their charges according to the net cost of carriage. On the contrary, railway transport becomes a monopoly the holder of which attempts to cover, with the receipts, not only the expenses specially incurred by the passage of each consignment, but also considerable general expenses which include interest on capital. Thus the charges are so arranged that, by a wise and complex system of rate-making, they draw from each branch of traffic all the receipts possible without impeding its development.

With regard to the financial position of the railways,

it is important to observe that the charges as a whole must cover the working expenses. A railway enterprise which, by a skilful arrangement of tariffs, attracts passengers and merchandise paying one centime per head or per ton per kilometre and can thereby effect the full loading of trains on both outward and return journeys does excellent business, since it receives more than it expends. It cannot, however, be satisfied with a similar result on all traffic, for then the profits would be quite insufficient to cover the general expenses and the charges on capital; but when it is impossible to obtain traffic at a higher rate it is still an advantage to make the reduced charge rather than lose the traffic.

In an examination of tariffs it should not be forgotten that it is not the average rate which is of importance, but rather, for the public, the particular rate of the special traffic which interests each section and, for the traffic manager, the total result. What the companies require is not to gain an average—over and above the special expenses of each train—of 50 centimes per train to cover the general expenses of working the traffic, and 2 francs or 2 francs 50 centimes to cover the charges on capital, but rather to secure—on the whole of the traffic—200,000,000 francs to meet the fixed expenses of operation and 700,000,000 or 800,000,000 francs to cover the interest and redemption of capital. A train which only leaves 50 centimes net receipts per kilometre contributes less than a train which leaves 5 francs per kilometre, but, nevertheless, it contributes to the receipts, and far from forcing other charges to be raised to maintain the average receipts at a certain level it promises a gain which

may afford opportunities for a reduction of the charges as a whole.

In order to appreciate the relative suitability of tariffs by which certain trains give 5, 6 and 10 francs net receipts per kilometre, it is necessary to consider the general results of the enterprise. When, on the whole, the working of the railways only assures to the invested capital a just adequate remuneration, having regard to the risks involved and to the general interest on money, it would be wrong to say that the rates paid for transport are too high; in such a case it is only when they prevent the transport of useful material objects that tariffs may be considered unreasonable. If, on the contrary, the working of the railway monopoly gives very large profits, some reduction in the rates may legitimately be claimed, even for the transport of merchandise which can bear tolerably high rates, so that the public may profit by the prosperity of the enterprise in a measure compatible with the concession contracts.

Thus the general economy of tariffs should depend on the financial situation of the enterprise, on the value of transport and of its additional net cost. The two latter elements establish the limits between which the charges applied to the different classes of traffic may vary. The companies can only take account of these by general measures according to the principle of equality of treatment and not by individual preference, and it is this fact, above all others, which renders the tariff question a difficult one.

So far as net cost is concerned we have studied the influence of the traffic and the physical conditions of the lines, which are the two most important varying factors, but there are others by no means negligible,

such as length of haul, importance of celerity, avoidance of delay in effecting the transport, liability incurred by the undertaking, either from the terms of the contract or the nature of the merchandise, quality of the merchandise, cubical capacity in relation to weight, and the circumstances under which the traffic is loaded and unloaded, etc. There are, therefore, many factors which have an influence on rates, and these we shall further consider in connection with special rates.

The object of this and subsequent chapters is to indicate the general system of rate-making which, in France, has resulted from the combined application of legal and economic principles which have been developed. Thus it is our purpose to review the principal arrangements for the transport of passengers and goods by railway, and we shall particularly emphasise the general rules that are followed in the establishment of the tariffs, and the circumstances which sometimes cause a departure from these rules, not by a disregard of the principles, but by a healthy application of them.

Commercial circumstances cause the multiplicity and complexity of rates, and it is impossible, by submitting the tariffs to mathematical formulæ, to take account of them. Because all rates were not applicable from any one station to any other station a similar distance apart by railway an attempt was recently made to condemn the system of rate-making as being contrary to the national welfare. But this is absurd, for one cannot disregard the particularity of geographical location, the position of mountains, rivers and the sea, the economic conditions of production and consumption, and many other essential elements. That is why, whilst taking as a general rule the calculation of rates by schedules according to distance, account

must be taken of the most complex elements in order to establish a reasonable system.

Description of Tariffs

The *Cahier des charges* fixes the maximum rate or legal tariff for ordinary traffic, and it lies in the power of the Minister of Public Works to make reductions when these are necessitated by exceptional circumstances. The General Tariff contains the whole of the ordinary rates in force. It can offer consignors more favourable charges than those to which they are legally entitled, but it cannot deprive them of any advantages. The Special Tariffs are those which grant to the public certain advantages (usually a reduction in charges), subject to certain modifications in the conditions of the General Tariff. In some cases these are termed Export, in others, Transit Rates. The Through Tariffs are the general or special tariffs which contain charges applicable either to several railway systems or to one line of railway and another line of communication. Those rates which are only applicable to a single system are usually termed Local Tariffs.

To facilitate the calculation of the charges applicable to traffic covering several systems, the railway administrations jointly distribute a book which contains the distances between all the stations on each system and the junction stations with connecting lines, and also to certain large inland towns. This book, which is issued every three months by the House of Chaix, is kept up to date by the companies and is generally correct. The public can purchase copies and there find the requisite information for the calculation of charges applicable to most classes of traffic. But it must not be forgotten that this book is of an unofficial character

for which the Railway Companies are in no way liable. The Chaix publication is composed of two volumes, one, *Grande Vitesse*, (G.V.) of 986 pages, and the other, *Petite Vitesse* (P.V.) of 1,732 pages. These volumes include the rates applicable to all classes of passengers and all descriptions of goods between nearly 15,000 French stations and some 4,000 foreign ones, and offer—in many cases—alternative rates. It is somewhat astonishing to find so much information grouped in one publication, and we have often heard astonishment expressed by writers of foreign countries where no analogous publication exists.

The tariffs of each company have been established gradually and without any idea of uniformity. In the course of the negotiations which preceded the vote of the Convention of 1883, the companies undertook to revise the whole system of tariffs. This revision has been effected successively, firstly on the local rates, then on the through rates in the course of following years; it has effected considerable simplification in the tariffs.

In many cases the revision has substituted scales applicable to the whole of each system for the special rates between different stations. These rates, multiplying in proportion as the necessity for reductions became apparent, had finished by rendering exceptional the application of kilometric formulæ (which were supposed to constitute the general rule) to many grades of traffic. In the new tariffs, however, each company has established new formulæ extending to all its system the reduced charges which had, little by little, become almost general by the progressive multiplication of the reductions. All the old special rates, whether higher

or equal to the rates resulting from the application of the new formulæ, and those which were only a little lower, in addition to the rates which were not actively in operation, were expunged, and, as a consequence, the number of these charges has been considerably reduced.

More, however, might have been done in suppressing the special rates which had ceased to be justified by circumstances. At the commencement, notably on the P.L.M. system, an attempt was made to effect a radical reform whilst still according the essential reductions on heavy traffic. Then happened what would always happen under similar circumstances. The traders affected by the increases protested very forcibly, whilst those who profited by the reductions remained silent. The reform, therefore, though representing considerable progress, caused great discontent.

The reform has, however, eradicated many inequalities, and this is shown by some large reductions. This result has been marked at the outset by the coincidence of the revision of the tariffs with a period of industrial crisis which especially diminished the amount of coal traffic and raw materials carried at the lowest rates, so that the average charge per ton-kilometre on the whole of the traffic increased a little. But the importance of the reductions, visible from the inception, was clearly manifested in the average rate when the traffic recovered. It was singularly apparent then in consequence of the new reductions and of the development of heavy traffic.

So far as the *Grande Vitesse* tariffs are concerned, three companies only had proceeded to revise these at the same time as the *Petite Vitesse* rates. But the diminution of the tax, which came into force in 1892,

and the various rate reductions that accompanied it, have accomplished a general revision which has introduced an almost complete uniformity in the *tarification* on the different systems and has given to the general tariffs for goods the character of a tariff common to the large companies and the State railways.

As regards the *Petite Vitesse*, the revision of the local tariffs of each system has been effected by giving the character of class rates to all the cases in which there does not appear to exist any real reason for the establishment of a difference. Already, in the course of this revision, an improvement is to be observed in the grouping of similar rates for all companies so that each description of merchandise only appears in one tariff where it is found along with similar merchandise which bears a common nomenclature on all the systems.

Since the completion of the revision of the local tariffs, this method of simplification has been extended to the through tariffs, these having been considerably increased, whilst a General Classification of Merchandise and Conditions, applicable to all general and special tariffs—and common to all the great systems—has been established.

The whole of the rates system of the French railways is very complicated, because often the variety of the goods, the conditions of transport, and the difference in the economic, geographical and technical situations afford scope for innumerable combinations. But there can be no doubt that the revision of the tariffs, which occupied a period of nearly twenty years, has effected a substantial improvement.

Immediately after the revision, however, each company had to commence adding to its tariffs in order that it might adequately meet the growing require-

ments of commerce, and so the simplified rates immediately began to be complicated by new special rates. To attempt to obviate these charges, however, would be to cause a stoppage in the reduction of tariffs. A company always hesitates to effect a reduction applicable to the whole of its system, for it cannot adequately gauge the prospective result of its enterprise. On the contrary, one can often calculate—with a reasonable approach to accuracy—the increased tonnage that may be expected by the reduction in a rate applicable between certain defined points and for a given flow of traffic. Thus it is gradually, though often subsequently generalised, that the progressive reduction of the price of transport is effected.

In order to avoid falling into an excessive complication, however, it is necessary to frequently revise the charges so that those which have lost their utility may be discontinued; in addition, it is essential to remember that special rates indicate exceptional conditions and that, when such rates are multiplied for a class of traffic, this fact proves that the general scale is too high and should be replaced by a reduced scale which permits a reduction in the special rates. Thus the good results of the tariff revision will be maintained and will continue to develop, for, if the whole is far from being perfect, the frame is good and readily lends itself to improvements. But, in order to realise them, it is necessary not to sacrifice progress merely for the sake of uniformity.

CHAPTER II

RATES IN APPLICATION

THE tariff system is composed of two essential elements: the scales, by means of which the charges between any two stations may be calculated according to distance, and the special rates applicable between certain stations only. The determination, application and combination of these scales and special rates may be submitted to various general rules, and these we now propose to elucidate.

Scales

In the attempt to substitute mathematical formulæ for special rates it has been necessary to compile types of scales sufficiently diverse to correspond to various requirements. We have shown how these scales are represented by certain diagrams when taking the distances as the abscissa and the rates as the ordinates. It has also been indicated that, as regards merchandise, the Belgian system (*Barême belge*)—in which, as the distance increases, the kilometric rate decreases—is almost exclusively used in France.

Each company has a certain number of general scales, to which the classification refers. The classification indicates that certain merchandise under certain conditions shall be transported at the scale charges, 1, 2, 3, A, B, C, etc. Each scale gives the price of

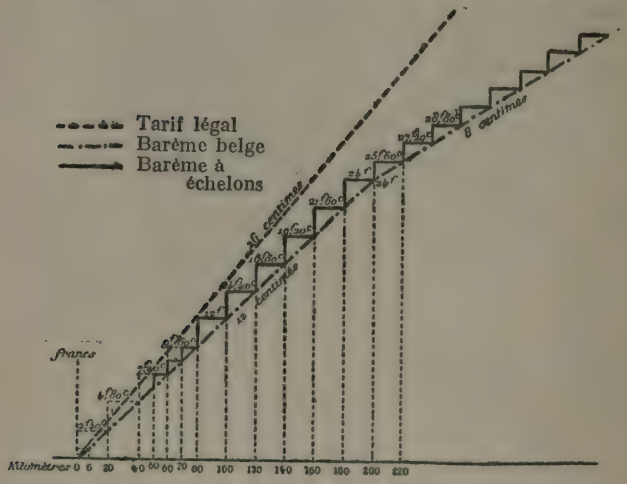
transport for varying distances calculated according to the adopted bases. When any of the general scales is not suitable to a class of goods the circumstances of which offer some peculiar features, a special scale is established.

Let us suppose, for example, that a certain description of merchandise can, without difficulty, pay rates increasing up to a certain figure, say, 25 francs per ton, and that it is impossible further to raise the rate without losing the traffic. If the usual scale indicates a rate of 25 francs per 500 kilometres the simplest method of arrangement is to require but one centime or a half-centime more for each additional kilometre; it is even possible, if necessary, to make a "flat" rate by stipulating that, once the rate has reached 25 francs, it will cease to increase so that the same rate shall be applied to all distances exceeding 500 kilometres. Where practicable, however, it is better to impose a small increase in the charge as the distance increases. But a "flat" rate is advisable when such is essential to the transport of the merchandise.

In the same way, when it is found necessary to reduce the charges applicable to a certain class of traffic because the general tariff does not include suitable rates for distances exceeding 300 kilometres, it is advisable to establish a tariff admitting a type of "flat" rate (*palier initial*). This is accomplished by creating a scale which starts from a given charge, say, 20 francs for 300 kilometres, and which then imposes charges increasing by 5 centimes, then by 4 centimes, etc., per additional kilometre. It must, however, be noticed that, in such a case, the charge of 20 francs is not applied to all distances less than 300 kilometres, because the scale of the general tariff continues to

apply for distances lower than 300 kilometres until the rate aggregates 20 francs; if this distance is 200 kilometres, for instance, it is only between 200 and 300 kilometres that the fixed charge of 20 francs will apply and furnish a "flat" rate.

The scales almost always apply in accordance with the regulations for the application of the legal tariff,



any distance lower than 6 kilometres, being counted as 6 kilometres; beyond this distance each kilometre is counted separately and each fraction of a kilometre as a kilometre. Actually the kilometres should be graphically represented—as the variation in cost continues—by small steps, answering to each kilometric base attained, but it is advisable, in order to simplify the diagram, that a continuous line or curve should be substituted.

In some cases the tariffs stipulate that the charges

shall be calculated in multiples of 5, 10 or 20 kilometres. The tariff is, therefore, represented by a series of steps as shown in the graph. This system was applied in a general manner by the P.L.M. It has sometimes been urged that it constitutes a violation of Article 42 of the General Conditions (*Cahier des charges*) according to the terms of which the charges operate in relation to the kilometres run ; indeed, it is pointed out that, in the case of one figure, the same rate is chargeable for 121 kilometres as for 140 kilometres. But Article 42 only regulates the maximum tariffs and, provided that the charges remain below this maximum, nothing prevents reductions in the shape of a scale with steps (*barême à échelons*), by a scale with levels, *i.e.*, with "flat" rates, by special rates, or by any other form of non-kilometric charges. The length of the steps admissible depends on the difference between the base of the legal tariff and that of the applied tariff, and on the length of the journey. The graph indicates that, if a rate at the initial base of 12 centimes is applied to merchandise for which the legal tariff is from 16 centimes per kilometre, it is only above 80 kilometres that, without exceeding the legal maximum, the charges may be reckoned in multiples of 20 kilometres, whilst they could be reckoned in multiples of 10 kilometres commencing at the 50th kilometre.

Apart from legal considerations, however, a system of scales should be condemned when the difference between the charges which constitute the successive steps is large. It is always troublesome to find a rate, after having remained constant despite substantially increasing distance, vary suddenly from 1 to 2 francs for an additional kilometre. But, when the base is sufficiently reduced so that the steps answering to 10 or 20 kilo-

metres only offer differences of a few pence between the successive charges, this mode of calculation is not at all inconvenient, and it constitutes a useful simplification. It might here be said that, for merchandise on which very reduced bases apply for long distances, the calculations would be considerably simplified by adopting the myriametre in lieu of the kilometre as a unit beyond a certain distance.

Computed Distances

In addition to some general rules respecting the calculation of distances to which the application of a scale may be subordinated, special regulations are in force by virtue of which certain specified distances never figure in the calculation of the rates for their actual length. It is then said that there is a computed distance (*distance d'application*) or distance of reckoning (*distance à compter*), which must not be confounded with the actual distance.

A computed distance may be longer than the actual distance. It is a rare case in practice, however, and can only result from an exception to the *Cahier des charges*, since it leads to the application of a higher charge than the legal maximum each time a kilometric tariff near the maximum is applied. There are, however, certain examples of this arrangement. Thus the *Midi* and *Orleans* companies, joint *concessionnaires* of the line that crosses the Garonne at Bordeaux, are authorised—by the Convention of August 1, 1857—to add a kilometre over the actual distance for each amount of 300,000 francs expended on the construction of the bridge so long as the total added distance does not exceed 5 kilometres. Then, on the line giving access to the Mont Cenis tunnel, the *Cahier des charges*

has authorised an exceptionally high rate between Modane and Saint-Jean-de-Maurienne, this being effected by the inclusion in the tariffs of an addition to the distance, primarily fixed at 100 per cent. but, since 1874, reduced to 50 per cent.

If the computed distances showing an increase are rare, those which admit reductions are, on the contrary, very numerous. There are some which result from Conventions accepted by the *concessionnaires*. For instance, in 1863, the *Midi* company wished to establish a direct line from Marseilles to Cette which would have formed a shorter route than that of the P.L.M. company. The Government, however, refused to give its consent, under the belief that the multiplication of lines serving the same districts constituted a squandering of capital, but in order to give the public the benefit of the reduction in distance which the new line would have afforded, it compelled the P.L.M. to count the 205 kilometres (since reduced to 178 kilometres) between Marseilles and Cette as 160 kilometres. Other regulations exist which compel the companies to ignore in their tariffs the distance entailed by circuitous routes.

In a much greater number of cases reduced computed distances have been proposed by the companies. The reductions thus established have, for the most part, been negatived in the revision of the tariffs. Some of these still exist, however, and these are well illustrated in the following examples.

On the *Ouest*, between Seine-Inférieure and Calvados, a long detour is entailed by the necessity of crossing the Seine at Rouen, but the distances are calculated as if the line crossed the Seine between Quillebœuf and Port-Jérôme. In the same manner, 160 kilo-

metres is calculated instead of the actual distance of 251 kilometres between Havre and Caen.

The *Nord* is the only system on which there are still a large number of computed distances in force. Many are intended to correct the circuity of routes; many others are necessitated in order to avoid diversion of the traffic between stations near the frontier to the Belgian railways; finally, the largest number owe their origin to water competition. Thus the ports of Calais and Dunkirk, served by canals, and situated 293 and 304 kilometres respectively from Paris, and 109 and 87 kilometres from Lille, are both calculated as 267 kilometres from Paris and 72 kilometres from Lille. Boulogne, which is only 252 kilometres from Paris, has no computed distance to that town; but there is a computed distance of 88 kilometres to Lille instead of the actual distance of 127 kilometres, for, whilst Boulogne has no service by water to influence the traffic, it is necessary to maintain the equilibrium between competitive ports.

The system of computed distances has often been criticised. It gives rise to the same objections as the factor of special rates, and is defended by the same arguments. The two systems permit of the adaptability of rates to the requirements of commerce and the necessities of competition; but their use involves very delicate estimation which may, at times, appear arbitrary. Like the special rates, computed distances should only be utilised when the need for exceptional reductions is absolutely proved. But when it is essential to reduce the rates on certain traffic between two points a computed distance enables the required object to be attained in a more simple manner than by the insertion of special rates in all

the special tariffs. The reduction, being applied to all commodities at the same time, has the further advantage of not seeming to give a particular preference, as so often assumed when special rates are applied to commodities which only one or two factories produce in the district served by the sending station. Finally, it often constitutes an advantageous means of avoiding —or, at least, delaying—the construction of a shorter route.

Scales for Limited Areas and Special Rates

The application of rates either to certain traffic for all distances (general scales) or to all traffic for certain distances (computed distances) does not allow the elasticity which the system of rates must possess, so that it may reasonably respond to the requirements of commerce. Reductions must often be specially given to certain traffic over certain distances because these enable the traffic adequately to develop. When the elements of the traffic, the carriage of which is prevented by the tariffs, can be developed equally in all directions around a determined centre, a scale is established, this not applying from any one station to any other station, but from all stations to the point in question, or from that point to all the stations on the system. Scales of this description are perfectly justified on the transport of provisions to a large town, the materials of a district with very rich quarries and, finally, for passengers travelling regularly between an important town and its suburbs. Motives of competition can equally influence reductions of this kind from or to the points at which the systems meet. One can well understand that the different conditions under which an industry is conducted on

two systems might lead to the application of two different methods of *tarification*. But, if these systems both terminate in a large centre like Paris, the line with the highest local rates will be compelled to provide a scale—applicable to traffic for that place—offering charges similar to the competing system so that the traders on its line will not be in an inferior position in the market to the traders on the competing line.

In some cases, reductions are only justified between certain definite points and, in these instances, special rates are established. This term is applied to a rate lower than that established from the application of the general scale. Such a rate is only applicable to traffic between two specified stations, it being created either in order to retain traffic which might be diverted to other routes, or in order to facilitate the transportation of the products of a district to a market in which there is competition, or in order to develop agriculture and industry by rendering possible the transport of traffic the value of which would be lower than the charge resulting from the application of the scale.

In the first case, no appreciable advantage is given to those who profit by the special rates, since they only obtain advantages similar to those obtainable on other lines. In the other two cases, on the contrary, commerce in the particular districts is granted facilities which were previously lacking, and this might result in considerable alteration in the respective situations of industrial or agricultural centres the products of which enter into competition. For guidance in connection with such reductions the companies consider the possibility of development, and when a trader can convince

them that development will be enhanced by suitable reductions he obtains a great advantage over his competitors, either for the supply of raw materials to his works, or for the despatch of manufactured articles.

In order to avoid abuse in this connection, the Consultative Committee of the railways only recommend reductions on the condition that the companies will establish—if requested by the Administration—similar advantages for similar traffic proceeding from or consigned to centres of production or of consumption that might be found in analogous circumstances. This arrangement enables the Minister to prevent the normal conditions of competition being modified by reductions in the rates, as it affords him the means of equalising the charges, whilst ensuring that the geographical and commercial situation in those localities where the reductions are necessary receive due consideration, either from events subsequent to the establishment of the tariffs or from circumstances which would not necessarily be apparent at the time of approval (*homologation*).

When special rates have, as their one object, the opening of access to new markets or to new points of supply in raw materials to different competing centres of production, it is necessary that these rates should be in harmony with the distances. This desire for exact regularity has sometimes been extended to special rates which had no more connection with each other than the appearance in the same paragraph of a special tariff. To attach importance to the placing side by side of rates of which the highest, for instance, might be applied to the shortest distance is to lose sight of the very nature of special rates, for these are

not intended to be at all proportional to the distance.

The anomalies between them are always considerably less than those they present in comparison with the charges on traffic that does not enjoy any special rate : if, for a class of merchandise charged, on an average, 10 centimes per kilometre, two exceptional rates are established on two distinct lines, one of 16 francs for 250 kilometres, the other of 15 francs for 300 kilometres, the defect of proportion in these two charges is obvious ; but the anomaly presented between them is nothing to that which each of them shows by comparison with the charge of 18 francs for 180 kilometres, of 20 francs for 200 kilometres, and others to an indefinite number that operate in virtue of the scale. In reducing the first special rate to 14 or 15 francs so that it would better harmonise with the second and thus eradicate a clear anomaly, the number of less visible anomalies that it presents in relation to the scale charges would be accentuated. What is most important is that each special rate, when compared with the scale, should only offer a really justifiable reduction. But if it is recognised that each of them is well reasoned out, comparisons between them are of no interest. It is necessary, however, to point out that a certain harmony in the special rates, even when these are applied between places where no competition exists, facilitates their ultimate replacement by a scale, and can, therefore, from that point of view, have a certain additional interest.

As to reciprocity in special rates, that is to say, in the facility given to the public of using them in the reverse direction to that for which they are established, it is only in exceptional cases where this is justified ;

indeed, it is rare to find similar merchandise moving in both directions on the same line at the same time. The important currents of traffic proceed from producing points to consuming points ; the collieries send coal to works, but do not receive coal from them. When similar traffic moves in large quantities in both directions it is usually because of a considerable difference in the quality ; the wines that Bordeaux despatches to the Aude district are not of the same value as those sent from the Aude district to Bordeaux, and there is no reason to apply the same rates. Again, water competition is not as important on, say, the outward as the return journey, because the price of freight is not the same in the two directions. Thus the establishment of a reciprocity would, in many cases, place side by side a special rate fully justified, and a second quite unjustified.

Stress should here be laid on the fact that the reductions of special rates for certain distances in no way constitute an arbitrary favour from the moment that they are justified by a particular economic or geographical situation. It is necessary well to remember, however, that the principle of equality of treatment, by virtue of which all traffic conveyed under the same conditions is charged the same, necessarily leads to profit when a reduction answering to the commercial necessities of certain districts is applied to other places ; there is no doubt that the special rates for the transport of coal between the *Nord* and the *Est* are imposed by the vital necessities of the metal trades, but it is equally certain that these reduced rates enable the inhabitants of Meurthe-et-Moselle to obtain their domestic coal at a cheaper rate than the inhabitants of the *Central* departments, situated the same dis-

tance from the collieries, but without any particular claim to this advantage. Without doubt, large reductions can profitably be made on coal forwarded by train loads to the metallurgic establishments ; but it is evident that between the transport prices raised under these conditions and those raised on other traffic there must be a suitable relation, for if the difference became too great the domestic coal would be obtained locally by arrangement with the forge managers.

There is, therefore, an inevitable repercussion, but this must not prevent the differentiation of tariffs so that they may answer to the double necessity of not impeding any traffic and of remunerating railway capital. It is necessary, however, to limit as far as possible the application of the greatly reduced rates to the traffic for which they are established, and only to establish them when the interests involved are of sufficient importance ; the fact that, in the districts where these interests preponderate, others incidentally will profit is the inevitable consequence of the impossibility of making a special rate for each consignment. We are then going to see how the geographical position entails a certain extension of the reduced rates to traffics other than that for which they are established, and how the Administration, instead of attempting to limit these barely justified advantages, has imposed certain conditions that extend them considerably.

Re-Forwarding, Combined Rates, etc.

When a reduced rate is applied, it is always possible to profit on longer journeys by re-forwarding. If, for example, a profit is desired on merchandise forwarded from Paris to Grenoble, there being a special rate between Paris and Lyons, the traffic may be consigned

to Lyons and re-forwarded to Grenoble. The re-forwarding entails certain formalities and the double payment of the tax, as well as incidental expenses. In order, however, to free the public of these annoyances and charges when the purpose of the re-forwarding is simply to profit by a reduced rate for a part of the journey, the Administration has instructed the companies to effect the transport and, for their remuneration, add together the lowest charges applicable to the different sections, without the addition of incidental expenses. This charge is represented by the term "combined rate" (*soudure*).

The combined-rate is a privilege common to all the systems. On those of the *Orleans* and the *Midi*, however, a tax of 40 centimes is added to the combined-rate, this being equal to the station expenses which would be due in case of re-forwarding. On all other railways the application of the combined-rate is performed without incidental charge. It is the same on the *Orleans* and the *Midi* when the combination is effected between the General and the Special Tariff D. 32. The conditions governing the application of the combined-rates are indicated in a special tariff which forms part of the Miscellaneous Regulations (Special Tariff P.V. 29).

In some exceptional cases, the companies subordinate a reduction in price to the formal condition that the rate shall not be liable to the application of the combined-rate. Sometimes the re-forwarding has even been forbidden when it would have the effect of diverting traffic from its normal route. There is an example of this on the State and *Orleans* systems. The Convention of 1883 ruled the bases of participation in the traffic, these being effected by arrangements

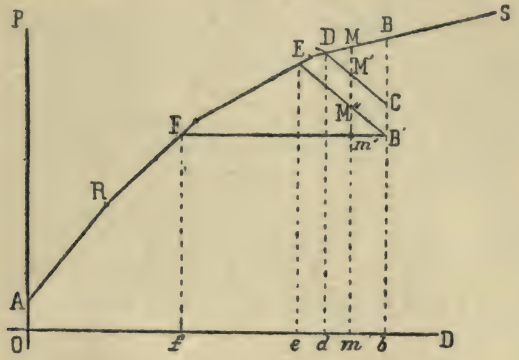
under which the maximum of the legal tariff is applied to all traffic consigned by other than the normal route. But it might happen that, in dividing the distance by the indirect route, the sum of the charges pertaining to the two fractions may be smaller than that of the total rate by the direct route. To avoid this circumstance favouring the indirect route, therefore, the application of the combined-rate is forbidden; and also the re-forwarding. In consequence, if a person wishes to re-forward a consignment by the indirect route, he has to pay the total rate of the legal tariff unless he takes delivery at the point where he divides the transport and takes the goods away from the station. In these cases, the expenses and the objections are such that diversion is almost impossible.

An analogous case is found at Rouen. In that town there are two large goods stations, the Saint-Sever station (belonging to the *Ouest*), on the left bank of the Seine, and, on the opposite side of the river, that of Martainville, this connecting with the line from Amiens to Rouen, worked by the *Nord* who are the *concessionnaires* of the line in common with the *Ouest*. So that the public may have the advantage of receiving or forwarding merchandise at the most convenient station a special tariff is in application, this charging the same rate on goods dealt with at each of the stations. But, as the convenience thus established for the transfer from one system to the other would have diverted certain goods from their usual route, it has been specified that these charges will not be included in a combined-rate to the intermediate station (Darnetal) where the junction of the two systems is located.

In the tariff revision it was necessary, so that certain reduced rates might be maintained between Paris and

Orleans, to create a special tariff (P.V. 32) which authorises certain special rates with a prohibition of combined-rates. The facility of combining the rates must, then, suffer from some exceptions in order that it might not prevent certain improvements, but these exceptions are rare and it can generally be said that the combined-rate is usual in France.

The re-forwarding, or the combined-rate, represents an advantage for those located near stations



which enjoy special rates. Let us suppose that on a length of line Ob for which the schedule AS, applicable to the whole of the system, gives a charge of 30 francs, represented by the height Bb, there exists a special rate of 20 francs represented by B′b. For a journey made to an intermediate point, situated at the distance Om, it would be possible to avoid the payment of the schedule charges Mm by forwarding goods to b, then re-forwarding to m ; the charge would then be M′m, this resulting from the addition of the special rate to the charge M′m′ given by the schedule for the distance bm.

In the combined-rate, the charge added to the special rate would be calculated according to the initial base of the scale without addition of the incidental expenses represented by B′C = OA, and the total charge would be M″m. It is clear, therefore, that the re-forwarding would be of greater advantage than the scale for the distances included between Od and Ob, whilst, with the combined-rate—without incidental expenses—the advantage would be extended to all points included between Oe and Ob.

The public do not willingly accept the fact that transport for an intermediate distance Om is more expensive than for the whole distance Ob. This anomaly is avoided in France by the application of the "intermediate station" clause. The principle is this: if a consignment be forwarded for a portion of a distance for the whole of which there exists a reduced charge, the consignment will have the benefit of it when the reduced charge for the whole distance is less than the charge resulting from the application of the general scale for the part of the distance. In the charges applicable to the line in question there will, therefore, appear a "flat" rate, represented in the figure by the line FmB′m and applicable to the different distances included between Of and Ob, distances to which, by virtue of this clause, the reduced charge B′b = Ff is applicable.

The "intermediate station" clause is applied not only to the special rates, but also to all the rates resulting either from computed distances or from scales applicable only from or to certain specified points. For instance, if the scales established for wines forwarded on the *Midi* to Paris offers a lower rate from Nimes to Paris than that resulting from the

application of other tariffs between Nimes and Melun, the traffic from Nimes to Melun benefits by it, as it pays the rate as though the total conveyance to Paris had been effected.

The "intermediate station" clause figures in the conditions common to all the special *Petite Vitesse* tariffs. If any exception is made it is that of the reduced rates which admit certain general restrictions. Cases of exception could formerly be found in the transit rates established on goods proceeding abroad, and on goods crossing French territory. In such cases the intermediate stations did not enjoy the advantage of a special rate; neither did the forwarding or receiving stations. Since, however, the companies have extended the benefit of transit rates to export traffic the intermediate stations enjoy special transit rates in the same way as the forwarding stations.

The effect of the "intermediate station" clause is to lessen the inequalities of particular situations by compelling the companies to accord advantages obtained by certain stations to those localities less fortunately situated. It is quite incorrect to say that its object is to prevent the railway companies from arbitrarily reversing the natural advantage of geographical location; it is the contrary that is true. It is the same nature that has rendered the conveyance of heavy merchandise between Marseilles and Dunkirk or Boulogne less costly than between Marseilles and Lille or Rheims; in applying the same charge to these differing distances the advantages resulting from a particular geographical situation are extended to other centres which would not naturally profit by them, for if railways did not exist conveyance between Marseilles and Lille or Rheims would be made *via* Dunkirk or Boulogne, and would cost more

than traffic destined for intermediate points on the most economical route. The special rate, therefore, which constitutes no favour between Marseilles and Dunkirk or Boulogne when it approximates to the pre-existing charge by sea is a real favour to the business between Marseilles and Lille or Rheims, to which the charge is extended.

The faculty of establishing tariffs represented by the saddle-back line AEB′ on the figure (page 101) would allow of the application of many combinations of charges which the "intermediate station" clause renders impracticable. For instance, the whole western side of France is supplied solely with English coal. To enable the northern collieries to compete in the market at Nantes it would be necessary to apply a tariff which enables them to deliver coal at the same price as the English coal, and this price—on the basis of about one centime per kilometre—would be quite remunerative on the transport of full train loads. The actual traffic from the northern collieries to Nantes being almost nil, it would be possible, therefore, without sacrificing anything, to attempt to develop the business by some reductions of rates to a level bordering almost on net cost.

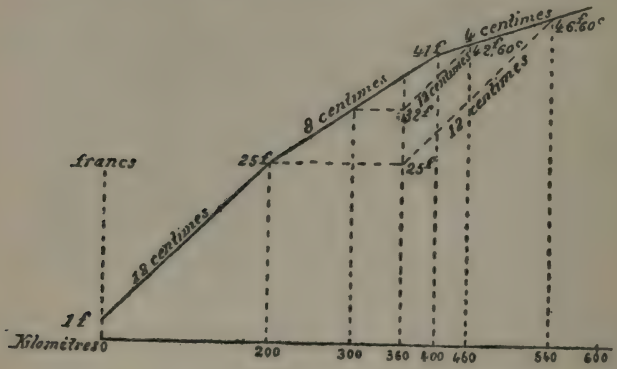
The English coal arrives at the intermediate stations *via* Nantes and is carried a certain distance by rail over and above the sea journey; the cost, therefore, increases in proportion as the traffic gets farther from the coast and as it gets nearer to the French collieries when the supply of coal from the latter begins to increase. The railway, then, carries a quantity of French coal, this increasing in proportion as the journey becomes less, though the carriage charges are higher than those possible for the whole journey to

Nantes. In reality, French coal forwarded to the west can bear higher charges to the intermediate stations, and the value of the transport is well represented by a broken line having a maximum in an intermediate district, the situation of which depends, firstly, on the price of coal at the pit-head in France and in England, and, secondly, on the freight charges between Cardiff or Newcastle and the French ports. In compelling the substitution of the "flat" rate FB′ (see Fig., page 101) to the charges represented by the saddle-back FEB′, the "intermediate station" clause goes contrary to commercial facts ; it practically prevents the establishment of the charge B′b and impedes a *tarification* which would be in accordance with the geographical situation and would be profitable both to the railways and to the French collieries.

In the same way an attempt might be made to attract to the most direct route, *i.e. via* Marseilles, the traffic in Australian wool used at Fourniers or Rheims. But the market for Australian wool is in London, and the freights are the same from the point of production to that port or to Antwerp as to Marseilles ; in order, therefore, to secure the wool traffic from Australia to this large Mediterranean port it would be necessary to accord equal, if not lower, charges to the destination point of the traffic than those in operation from either London or Antwerp, both of which places are situated more advantageously. It would then be necessary to accord reduced charges which it would be impossible to extend to wool from Algeria or the south of France without causing considerable loss on an existing traffic. An attempt was once made, without great success, to create a special tariff for Australian wool, but as such tariffs became applicable

to the intermediate stations, the rates were raised. Thus it is impossible to reduce the charges sufficiently to create a traffic which would be very profitable to French maritime undertakings, to her largest port and to her railways.

The "intermediate station" clause, together with the combined-rate, rather curiously extends the range of special rates. A special rate individually considered would be graphically represented by a



point below the line representing the scale applicable to the whole system. If a complete representation of its influence is required, whilst taking due account of the "intermediate station" clause and of the combined-rate, it is necessary to make a special graph of the charges on the line where the special rate exists, the charges to start from the station named as the forwarding station. The special rate then produces a "flat" rate for the section which precedes the station named as the receiving station, followed by a section where the lowest rate is obtained by combining this

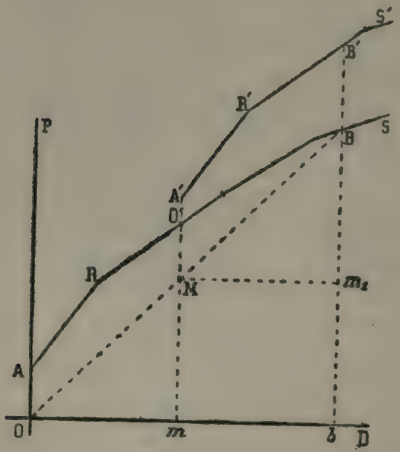
special rate with the kilometric charges calculated up to the starting point of the scale. The zone on which it acts is, therefore, more extended as the difference between the general scale and the special rate is greater.

The combined-rate and the " intermediate station " clause which usually indicate a modification of the special rate are, in reality, an amplification of its influence. Thanks to their conditions a reduction which is justified between two stations extends its effects to a crowd of connections for which there are not the same reasons for establishing it. It has been shown that the essential rule to observe in order to establish an equitable system of rates favourable to the development of commerce is not to forbid exceptional rates where they answer to the exigencies of the traffic; and only to admit them at places where the necessity exists. If these principles are strictly applied, the " intermediate station " clause would only be admitted on special justification. The combined-rate is inevitable since the rates resulting from it can always be obtained by re-forwarding; but, except under special stipulations, the rates should only be combined under the conditions which would result from re-forwarding, that is to say, by adding to each the terminal charges, and this would appreciably restrict the zone in which the combined-rate would be more advantageous than the application of the general scale.

Through Rates

The combination of local rates, whether they be scales or special rates is compulsory on the companies by virtue of the *Cahier des charges* which compels them to afford through facilities to the traffic. The considerations which lead to the reduction of the kilometric

charge for very long journeys, for competitive distances, or for the traffic particularly susceptible to development under the influence of a reduction in rate, have exactly the same value in connection with through traffic, as local traffic. The establishment of through tariffs is then brought about for all currents of traffic, sometimes for scales with decreasing base (*tarifs à base décroissante*) and sometimes for special rates (*prix fermes*), as if the different interested systems constituted one system. Analogous tariffs are sometimes established by railways in conjunction with steamship companies.



It is important to notice that even when two administrations apply the same scale to particular merchandise the fact of merging the rates into a through scale brings about some notable reductions, for, instead of restarting from the initial base at the point of junction, m, and adding the expenses of

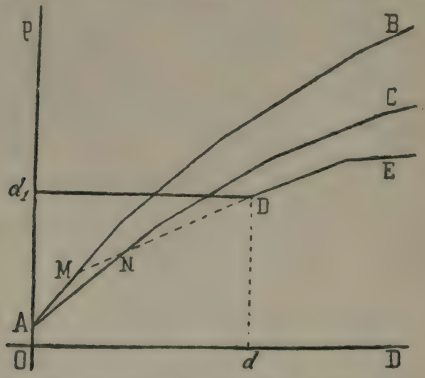
transfer O′A′, the decrease applies on the whole distance in the same way as the rate for the distance Ob is, for example, Bb instead of B′b.

As there is no reason for one of the systems to suffer a loss rather than the other, the total charge is divided *pro rata* to the distances so that the first system receives Mm and the second Bm_1. In France each company generally raises the charges attributed to it for terminal expenses, or for transfer, and the surplus alone is divided kilometrically. Besides, if the distance on one of the systems is but short, as the difference between the average kilometric charge is excessive, the participating systems sometimes accord to the less-favourably situated system an increase of its share in order to obtain its adherence to the through tariff. Special arrangements, so far as the division of the receipts are concerned, are made when the through rate diverts traffic which was particularly profitable to one of the participating companies.

The division of the receipts from the through rates is a matter of internal arrangement. To passengers and consignees the through rates are, however, indivisible and they cannot claim an advantage of an equal rate on the part of one of the participating systems for the distance effected on its rails, since this part has been reduced on account of the length of the total journey. The combined rate and the "intermediate station" clause operate on through rates as on local rates, but it is the total charge that is combined or applied to the partial distances. It is by its character of indivisibility that a through rate differs from a local rate. The local part of each system constitutes a charge only to traffic consigned to or from places mentioned in the through tariff, but this part cannot be separated

from the part apportioned to the surplus of the journey and the whole operates as a single charge.

In order to avoid this effect on local rates the companies often specify that the charges calculated by the through tariff cannot in any case be lower than the charges resulting from the application of the tariffs of each of the systems for the particular distance on their own rails. This causes the establishment of a "flat" rate in the charge on traffic from stations on one system to stations on another system, which charge applies between the junction point of the two systems and the point where the charges calculated according to the through tariff will exceed the charges



resulting from the application of the local tariff of the first system. Often, also, a "flat" rate is included in the through tariffs when the two interested companies apply very different scales, such as AB and AC, to similar merchandise. Should the two interested administrations recognise the necessity of establishing a reduced schedule such as DE for the long distances usual in through traffic they could not arrange this

scale with one of the two others, by applying to the through traffic the schedule AMDE or ANDE, without causing a loss to the first system on traffic which does not travel above the distance Od. The through schedule DE is then established with a minimum Dd in such a way that the combination of the local tariffs continues to apply for all the distances on which it gives a total charge lower than this minimum.

It will be seen, therefore, how some tariffs, little rational in themselves—as the "flat" rates—should often be admitted in order that the reduction of charges useful to the development of traffic may not be rendered impossible by the repercussions that they would entail on an existing traffic. The companies would never expose themselves to such repercussions, because they would entail losses higher than the receipts to be hoped for as a result of the reductions, unless they could limit the effects of such reductions by special stipulations

PART III

EUROPEAN AND AMERICAN PRACTICE

CHAPTER I

GREAT BRITAIN—CONTROL AND RATES

THE great liberty of action possessed by British railway companies has engendered numerous abuses in England, and the opposition of Parliament to the suppression of competition has prevented the complete disappearance of the principal cause, viz., the undue advantages offered to merchants for whose traffic several railway companies compete. The length of legal proceedings and their high cost, greater in England than in any other country, has prevented the application of a real remedy. Several Acts of Parliament have been passed in an attempt to substitute for the existing machinery more practical jurisdiction, or to give to the Board of Trade a more effective control over the railway companies.

The Act of 1873, which rendered obligatory the publication of rates, created a Commission of three members, one of whom must be a lawyer, one a man familiar with railway questions, and none of whom should in any way be financially interested in railway or canal undertakings. This Commission had the powers of a High Court and its decisions were final as to fact. It was to hear and determine complaints respecting the lack of reasonable facilities—as prescribed by law—and those having reference to allegations of undue preference. The Commission could, in addition,

arbitrate between the companies in cases of dispute, and adjudicate equally on matters of technical organisation, as in the fixing and division of the transport charges, in order to compel the various railway companies to co-operate in the establishment of through services. It is this last attribute that has been most frequently exercised. The Commission has, however, usefully interposed in many cases to eradicate inequalities or abuses in the matter of rates.

The Railway and Canal Traffic Act of 1888 confirmed and extended the powers of this Commission and enforced on canal companies some of the obligations imposed on the railways, notably those which had reference to the publication of tariffs and the compilation of Returns. It gives to the Commission, so far as the canals under railway management are concerned, the right to require that the charges and tolls of any kind collected for the transport of goods on the canals shall be reasonable when compared with railway charges. The Act further requires railway companies to maintain a good state of navigation on canals belonging to them.

By the Act of 1888, the Board of Trade were given powers to investigate complaints which should be addressed to it, and to communicate with the railway companies in those cases which appear to them to be established, this procedure often avoiding the expense and weariness of a law-suit; but if the companies refuse to comply with the views of the Board of Trade that body can only record the fact in a public report and leave the matter with the interested parties to obtain a decision in the Court. The English appear to consider this appeal to public opinion more efficacious, in fact, than a power of decision conferred on an

independent authority which could only use such power with extreme reserve.

The Act of 1888 specifies that when a company establishes lower rates for a trader, or for traders of a particular class than those accorded to other traders for similar services or similar traffic, it is on the company that the obligation falls of proving that the inequality does not constitute an undue preference. In addition, the Commission has power to forbid companies charging a higher rate on the same line for a short distance than for a longer distance effected by traffic of a similar nature; but there is one case in which the Commission cannot hold strictly to this position; that is, if the company justifies the difference of charge as being caused by the necessities of commerce.

The Railway and Canal Traffic Act of 1888 ordered a general revision of the classification and the maximum rates in operation both for conveyance and terminal charges. The companies having failed to agree with the Board of Trade regarding the revision, a further Act of Parliament put a new legal tariff in operation and a uniform classification divided the merchandise into eight classes, as follows :—

Classes A, B and C, which comprise heavy merchandise forwarded in loads of 4 or 2 tons.

Classes 1 to 5, which comprise goods of greater value, without "condition of tonnage."

Finally, all goods mentioned in classes A, B and C, under certain conditions as to minimum tonnage, are raised in one or two other classes for the conveyance of smaller quantities.

The authorised maximum charges differ on the various lines and each company has special scales on

particular sections of its lines. All the scales are based on the Belgian system, the rate per mile decreasing very rapidly as the distance increases. The following may be taken as average prices for many lines. Initial rates (in force up to 32 kilometres) vary in accordance with the merchandise from 6 or 7 centimes (class A) to 27 centimes (class 5); final rates (in force for each kilometre over 160) vary from 2·6 centimes to 16 centimes. Station terminals augment these amounts by 63 centimes per ton (class A) to 3·78 francs (class 5), and Service terminals by 0·315 francs to 2·10 francs. Under these conditions, for a conveyance covering 200 kilometres, for example, the class rates would be: coal (4-ton lot), loaded and unloaded by traders, 9 francs; iron in bars, under similar conditions, 13 francs; corn (2-ton lot) in company's wagons, 20 francs; goods in class 5 (the highest), without tonnage condition, 50 francs.

These charges, though high, were considerably lower than those in force prior to the revision on certain sections where no competition existed or where the working was costly, but they remained much higher than the charges generally in force. The companies were instructed to apply the new classification and charges from January 1, 1893, and as there was not sufficient time to effect the necessary alterations in the rate-books, the legal rates were almost universally charged. These, in comparison with the previously existing rates, showed a large increase and were, of course, only of a provisional character, as they could not be maintained without seriously injuring the traffic. However, a strong storm of protest arose and this had such weight that a new Parliamentary enquiry was ordered, this resulting in the Act of 1894 by which

railway companies could be called upon to justify before the Railway Commission all increases of rates since December 31, 1892, even though such increases were within their statutory maxima.

The companies could make alterations freely within the limits of the new maxima, except that they must be prepared to justify any increase on complaint. Their rates system has an essentially commercial character. It almost exclusively consists of special rates which vary according to circumstances. Competition causes certain very low rates on some sections, especially where the interests of rival ports are involved, whilst the considerable expense caused by the multiplicity of lines serving the same districts has caused the railway companies to maintain high rates on non-competitive traffic. The application of mathematical formulæ for rates is impossible; for nearly all traffic special rates are charged and the consignors of large quantities benefit by rebates which are normally the outcome of conditions.

The goods service is quite different in England from that on the Continent, as there is no distinction between the charges by fast and slow services. The goods trains are composed of a smaller number of vehicles than in France and run almost as fast as slow passenger trains between which they are worked with facility.

The rates in force generally include collection and delivery, and the result is that, in the majority of cases, the companies effect the whole of the transport, the unloading at and delivery from destination station being, therefore, done with great celerity. These arrangements ensure the normal transport in one night from London to the large commercial centres of the

north of England, and from London to Scotland in 24 or 48 hours. Such celerity doubtless augments the haulage expenses, but it better utilises the rolling stock, diminishes the user of the road and tends to prevent goods stations becoming congested.

The functions of transport are, therefore, rather costly in England and, consequently, the rates are high. The advantage of such a speedy service is that firms are able to carry smaller stocks and so limit their warehouse accommodation; business is done on samples, and the commodities ordered one day by wire arrive at destination the following morning. These are important advantages, but it must be observed that no general regulations exist, and that only traffic between the large centres profits by such services.

When their lines are congested, English companies are obliged to accept traffic only to the capacity of their accommodation. They have by no means a large quantity of rolling stock, this being due to the fact that the large firms possess their own wagons for the conveyance of minerals, and this traffic comprises three quarters of the transported tonnage.

Notwithstanding the advantages obtained by the celerity of transport, French commerce would find the expenditure too high if such celerity were to be obtained only by the adoption of English rates. It is difficult to estimate the average rate for each ton-kilometre or for each passenger-kilometre, as the English companies do not publish any statistics indicating the length of journeys, but it would appear that English rates, both for goods and passengers, are considerably higher than the French tariffs.

CHAPTER II

UNITED STATES—METHODS OF CONTROL

ABUSES were formerly more frequent in America than in England, as there was no established control of the railways. In certain States the companies' charters did not even limit their tariffs by a maximum. The outcry against this situation started in the United States at about the same time as in England, but it has been carried to a greater extent, and the legislation to which it has given rise is very complicated because of the co-existence of laws in the various States, which are only competent to regulate their internal traffic, and the federal laws, which only affect interstate traffic.

It was in 1870 that the States commenced to occupy themselves with the railway question. The rapid colonisation in the West brought the matter to a crisis, as the " Grangers " attributed the difficulty they had in disposing of their products at a remunerative price to high railway rates. As a result of these complaints Granger laws were passed in several States, but as some of these were very severe they caused a stoppage in railway development and, as a consequence, were very quickly repealed.

The real effect of the legislation, however, was the creation of administrative commissions to find abuses, either on their own initiative or on the complaint of interested parties. At the present time there are

commissions in 35 out of 46 States. The powers of the commissions vary considerably; in the Eastern States some can only communicate their opinion by means of public reports, whilst others can summon the companies. In certain States the railway commissions have power to prescribe maximum rates and to revise or reduce previously existing ones, whilst in others the Legislature exercises this control more or less rigorously.

The federal constitution, on the one hand, guarantees the propriety of, and, on the other hand, has the right and duty to refuse sanction to non-constitutional laws; the Court is thus able to decide whether prescribed reductions of rates are excessive and such as might deprive a railway company of the legitimate remuneration of its capital—which is almost equal to confiscation. The Supreme Court is, then, the last resort to decide the validity of the federal laws as well as those of the various States, which are acts of the Administration in virtue of these laws.

Violent conflicts sometimes ensue, but private rights find this resort a great safeguard. Quite recently a great number of States prohibited the charging by the companies of more than 2 cents per mile (6·44c. per kilom.) for the transportation of passengers, and they decreed severe penalties against those who maintained higher fares and against the agents who collected them. The federal judges forbade the application of these laws as confiscatory, whilst the local tribunals attempted to assure their operation, at least, provisionally, and until the Supreme Court had given judgment on their constitutionality. These provisional arrangements are often applied to the companies by the various States, but several judgments recently given by the Supreme Court appear likely to put a

stop to these reductions in price—which are considered arbitrary and excessive.

The federal jurisdiction has decided that the limitation of tariffs by a maximum, conforming in principle to the common law, cannot be pushed so far as to deprive the companies of their legitimate revenue. The amount of the remuneration to which an enterprise has the right is, without doubt, a highly controversial question, and it is a delicate matter for judges to decide whether the insufficiency or exceptional amount of the profits of a company are the result of the incompetence or competence of those who have created it and manage it, on the one hand, or, on the other hand, of the confiscatory reductions or exaggerated elevation of its tariffs. But, notwithstanding the difficulty of determining these matters, the judicial recourse open to the companies is often very useful to put a stop to arbitrary legislation.

In 1887 the Federal Congress created an organisation of control called the Interstate Commerce Commission, the authority of which has been extended and more clearly defined by the Acts of 1889, 1893, 1903 and 1906. This Commission consists of seven members, of whom four at the most may belong to the same political party. Its principal function is to ensure the due publication and observation of tariffs; it also controls the application of certain measures of security, arranges the forms which have to be used for the accounts and statements of the companies and prepares statistics from these statements. The Commission publishes annual reports on the matters coming within its jurisdiction. Its scope includes not only railway companies, but also Express companies—which organise a great portion of the direct services in the

States—Sleeping-car companies, pipe lines, and the accessory services of warehousing, etc.

The various laws that have been passed with respect to interstate traffic render obligatory the publication of tariffs, and require that all modifications be published and notified to the Commission at least 30 days before they are put in force, with the exception of those specially authorised. In addition, the application of rates higher than those published in the tariffs, any rebates, and any special agreements are absolutely forbidden.

Until 1906 the Interstate Commerce Commission could only declare rates unreasonable, either of themselves or in comparison with others, but to-day it can fix maximum tariffs which should be substituted for the tariff in question, and its decision remains binding for two years if same be not modified by a judicial decision. To obtain such a judgment the railway company must take the initiative and prove that the decision of the Commission was wrongly founded. The Interstate Commerce Commission never interferes except in the case of a complaint regarding a specified rate; it cannot force the companies to substitute a mathematical *tarification* for the commercial one; its real purpose is to eradicate the differences in tariffs that exist between localities where such cannot be justified and, above all, to prevent secret rebates which may be the result of special agreements.

It may be interesting to indicate how, notwithstanding the severe character of the legislation, the principles of the commercial *tarification* are respected. Amongst the enactments is one that almost coincides with the French "intermediate station" clause, by which a railway company is forbidden to charge more

for a short journey than for a long one if the first is included in the second and the transport is effected under similar circumstances and conditions; but the Interstate Commerce Commission can permit a breach of this rule in justified cases. The Commission is not disposed to use this power in a general manner. It recognises, however, that all circumstances are not the same and that the short-haul clause is therefore inapplicable in cases where two acts of conveyance are compared, one being effected between two places where railways are liable to the competition of river navigation or of the coasting trade or of a foreign company, and the other between two intermediate stations where no competition exists.

If the law should otherwise be interpreted it would practically mean ruin to the railway companies, as it would often compel them either to refuse traffic or greatly to reduce the local tariffs. In the case of competition between railways both liable to federal legislation, the Commission considers the short-haul clause legally applicable, the situation being then equal, as neither could reduce tariffs in order to divert competitive traffic without interfering with its own local receipts. But the Supreme Court has decided that competition between railways is sufficient to create different circumstances, and this renders the clause inapplicable. This legislation is very different to the simple practice of the French Administration, and gives to the short-haul clause a much modified significance. In general, it might be said that the clause is ignored where unequal rates (which this clause pretends to eradicate) are not purely arbitrary, but answer to the requirements of commerce.

It is due to the control of the Supreme Court that

legislation does not unduly interfere with the adoption of differential rates when they are justified. Unjust discriminations have considerably diminished, but it would appear that abuses are still more frequent in America than in England (although the organisation of control is more extended) by reason of the steps taken to prevent agreements, which would put a stop to competition—a material cause of unequal treatment.

The reports of the Interstate Commerce Commission are very instructive on this point. In many instances they condemn the rate wars which prevent all stability of price, and state that the establishment of a joint committee of direction (instituted by the common consent of companies serving the same districts) is the only way to prevent these wars in future ; they further state that prohibition of such an arrangement renders futile the steps taken to prevent unequal treatment. The reports also point out, and it is an important matter, that were the companies authorised to institute a real monopoly, the organisation thus created would exercise such an action on the economic life of the country that it would be necessary for a public authority to exercise a permanent control over the railways—which would really mean the adoption of the French *régime*.

CHAPTER III

UNITED STATES—RATES AND TRAFFIC

The goods traffic of America is immense in quantity and out of all proportion to that of European countries. In 1905–6 the traffic reached 812,000,000 metric tons, making an average journey of 387 kilometres, this representing a total of 315,000,000,000 ton-kilometres, or seventeen times that of France.

The tariffs applied to the traffic vary considerably in accordance with the nature of the merchandise and the distance of the transit. There are four principal classifications of goods, these having been established by agreement between the companies serving the same districts. The Interstate Commerce Commission has largely contributed to the making of these agreements, but, as the Commission remarks, they involve a common organisation which accords ill with the application of legislation that forbids the railways to establish an *entente* which would be likely to weaken competition. There is no uniformity in the rates, which are largely composed of special rates varying considerably with the distance and the nature of the goods. Between unimportant localities prices are as high as 37 centimes per ton-kilometre on small consignments, whilst on large consignments for long distances, on such a commodity as corn to the seaboard, for example, the charge is as little as 1 centime or less. On mineral traffic still lower rates are applied.

The prices generally vary in accordance with the commercial situation and in ratio to the strength of combination or competition. The companies justify the small increases from 1899 and 1904, when the constitution of large groups put a stop to tariff wars, to the general increase in prices, and it is to be noted that although this increase has since continued, the great augmentation of coal and mineral traffic has caused a decrease in the average rate. The large railway companies claim, and with some justification, that it is quite legitimate for railways to increase their prices—in the same way as other industries—when general prosperity in business compels them to give greater remuneration to their staff, and to pay more for their materials and for coal. In addition, they point out that as they come to the assistance of commerce with a reduction in rates in case of crisis and a general decrease in prices, their clients should support such increased rates without complaint.

Inversely to the goods traffic, passenger traffic is not very considerable in the United States when the population is compared with that of European countries. In 1905–6 its passenger traffic was less than double that of France, whilst its passenger-kilometre figures were no more than three times that of France. There is only one class of carriage for short distances, and the fares are very high as compared with European fares for short distances; they vary from 6 to 12 centimes per kilometre. On long journeys, however, such as are usual in the United States the fares are greatly reduced, but, even with such long distance passenger traffic, the average fare (6·45 centimes) is almost double that of France.

The very low freight rates in the States have been

rendered possible by the adoption of a transport organisation perfectly adapted to the special circumstances of the traffic. Enormous quantities of traffic are conveyed distances of 1,500 to 2,000 kilometres without the necessity of breaking bulk, and the American companies have utilised very powerful engines and high capacity wagons. Of 1,800,000 cars in use on June 30, 1906, 800,000 had a capacity of 27 to 36 metric tons and 560,000 a capacity of 36 to 50 tons. Trains having a haulage weight of 3,000 metric tons and a paying load of 2,000 tons are very frequent. The average load of goods trains was 163 tons in 1894 and 311 tons in 1906. The expense per train-kilometre during the same period increased in a much lower ratio from 3·64 francs to 4·41 francs. Under these conditions the net cost of transport is so reduced that the *co-efficient d'exploitation*[1] is not excessive compared with the French and but slightly exceeds that of the German and British railways. The utilisation of passenger trains is rather poor, but the companies find compensation in the high fares charged, and this branch of traffic is relatively of little importance to them.

In fine, the railways of the United States represent one of the most marvellous efforts of human industry to turn to good account the resources of a country. Through the rapidity of development and the decrease in transport prices—which is more important to a population spread over an immense area than to the crowded population of Western Europe—the railways of the United States have made of this territory a country which has one common economic life. They have enabled places most distant from the sea to populate

[1] Percentage ratio of expenses to receipts.

rapidly and to exchange their products with the chief centres of the old world. Notwithstanding the criticism which the many abuses evoked, the railways of the United States, without demanding of the State anything but liberty of action, have been the principal factor of its wonderful growth in agricultural, commercial and industrial power which may shortly attain world-wide supremacy.

CHAPTER IV

GERMANY—RATES AND TRAFFIC

WHILST England and the United States are the countries in which the operation of railways by private enterprise has most freely developed, it is in Germany that the most complete system of State-ownership is to be found.

. . . . . .

Owing to the density of the population, the enormous development of industry and the increased production of coal, the railway traffic of Germany is more than double that of France, the German railway receipts in 1906 being almost exactly double those of the French railways. The tariffs in application are the same for all German railways, at least so far as the main lines are concerned. The present system of tariffs is based more on the capacity of the wagon (*wagenraum tarif*) than on the nature of the merchandise. It is a simple system, but the advantage of this simplicity is greatly depreciated by the fact that the public are under the necessity of seeking the assistance of forwarding agents for the transport of all small consignments.

The origin of the present system in Germany is to be found in the *naturel* system invented in Nassau in 1867. According to this system the nature of the goods was not taken into account in the fixing of rates,

and the tariffs varied only in accordance with the speed of transit, the weight of the consignment and the type of vehicle utilised ; the value of the goods transported was only taken into consideration in connection with insurance against risks. Thus the amounts charged were rather in accord with the additional net cost of transport, and no consideration was given to the principal element in the determination of the rate, *i.e.*, the value of the transport. In fixing rates, therefore, it was absolutely essential to charge, as uniform tariffs, prices which could have been much higher for certain traffic and were much above what other traffic could bear. Naturally, by tariffs established in this way, certain receipts indispensable to cover the charges on capital might be unnecessarily lost, whilst commodities of small value might be too highly taxed.

This system was applied by the Imperial Administration charged with the operation of the railways of Alsace Lorraine after the war. It caused considerable discussion between the representatives of German railways, which naturally desired to secure some uniformity in their tariff system. Proposed by the Prussian and Hungarian State Administrations, this *naturel* system was rejected by most of the other Administrations, which preferred the older system in which the price of transport was largely based on the nature of the commodities. The companies then studied an intermediate system, and after long negotiations, and a crisis which compelled them temporarily to augment the rates on certain lines, formulated an agreement to adopt the system now in force over the whole of Germany and, in a modified degree, on the Austrian railways.

An analysis of the tariffs in operation on the Prussian

State railways indicates the following characteristics of the system. For slow freight, three general tariffs are applied to commodities of all descriptions ; one for less than wagon-load lots, tariff A1 for wagon-loads of 5,000 kilogrammes and tariff B for wagon-loads of 10,000 kilogrammes. There are also three special tariffs according reduced rates to certain traffic conveyed by slow freight in wagon-loads of 10,000 kilogrammes ; tariff I. for grain, wool, cotton, machinery, etc. ; tariff II. for iron in bars, steel, hemp, wood, cut stone, etc. ; and tariff III. for coal, minerals, salt, potatoes, etc. If the commodities enumerated in tariffs I. and II. are forwarded in wagon-loads of 5,000 kilogrammes instead of 10,000 kilogrammes, they are charged in accordance with a special tariff A2, and all goods mentioned in tariff III. when forwarded in wagon-loads of 5,000 kilogrammes are charged in accordance with tariff II. For small consignments of certain commodities there is a further special tariff in force. The initial bases of these varying tariffs in centimes per ton per kilometre are as follows :—

General Tariff.			*Special Tariff.*				
Retail	A1	B	Retail	A2	I.	II.	III.
13·75	8·375	7·5	10	6·25	5·625	4·375	3·25

Until 1898, tariff III. was the only one which had a decreasing base ; its prices decreased to 2·75 centimes per kilometre, commencing at 100 kilometres. Since 1898, however, in order to put a stop to the extension of groupage caused by the great variation in the charges for small consignments and wagon-loads for long transits, decreasing prices—starting from 50 kilometres—were arranged for small consignments. In addition to these normal tariffs there are certain

exceptional tariffs. These generally apply to the heavier classes of traffic and usually have a decreasing base; they also include special scales for certain distances. The rates for fast freight (*Eilgut*) are double those for slow freight (*Frachtgut*) whilst there is, in addition, an accelerated fast service for which the rates are again doubled. A special tariff, however, accords to certain traffic by the *Eilgut* service similar rates to those for small consignments by the *Frachtgut* service.

The bases of the tariffs which decrease more slowly than in France are generally lower at the beginning and higher at the end of a long transit. The relatively small height of the initial base is largely compensated for by the elevation of the total amount caused by the addition of supplementary charges. Terminal charges are 2·50 francs per ton for small consignments and for traffic in the tariff A1, and 1·50 francs for all other tariffs; they are, however, reduced for distances less than 100 kilometres to 1·25 francs or 75 centimes according to the tariff applied to the traffic. They include loading and unloading only for the "retail" traffic; all wagon-loads have to be loaded and unloaded by the consignor and consignee respectively, and if the railway company performs the service 50 centimes and, sometimes, 75 centimes per ton is charged for each operation. The transport of traffic in tariffs A2, I., II., III., or the exceptional tariffs is effected in open wagons except for those commodities which might be damaged through getting wet.

The characteristic of the system is that a wagon may be fully loaded with all descriptions of goods and the railway administration merely charges the wagon-load rate applicable to the merchandise contained in

the highest tariff. Under these conditions, the prices for small consignments of most commodities and those for complete truck loads are sufficient to enable the *groupeurs* to offer the public, for odd packages, more advantageous prices than the railway rates and still reserve a good profit for themselves. This system has considerably developed and has caused a large diminution in the number of less than wagon-load consignments; the application of the decreasing tariff of 1898 has not modified the situation in this regard to any great extent; whilst before 1876 the small consignments represented 10 per cent. of the traffic and consignments less than 5 tons 30 per cent., small consignments now represent 4 per cent. of the total tonnage conveyed, and consignments under 5 tons 5 per cent., the remainder being composed of 10 ton-wagons.

There is but little groupage for transits shorter than 200 kilometres, as the profits accruing to the *groupeurs* would barely cover the operating costs which are more or less independent of distance. For long transits, however, all the traffic passes through the hands of the *groupeurs*, consignments from or to the smaller towns being grouped by the agents at the nearest centre. The Berlin *groupeurs* are organised in a syndicate, and the following table indicates for two important transits the prices charged in the railway tariff and those charged by the syndicate :—

	Berlin to	
	Hanover. (256 *km.*) francs.	*Cologne.* (584 *km.*) francs.
Railway tariff for less than wagon-load consignments	34·40	62·00
Tariff B for full wagon loads ..	20·75	42·875
Charges of the *groupeurs*	30·625	55·00

The railways do not effect any considerable transport of less than wagon-load consignments and the average rate received hardly exceeds the rate for wagon-loads of 10 tons. But the public only benefit by a small fraction of the reduction which results from grouping, as the *groupeurs* keep for themselves about two-thirds for a distance of 584 kilometres and nearly three-quarters for a distance of 256 kilometres. For shorter distances or between unimportant towns, the public have to pay the charges shown in the railway tariffs, as the agents keep the whole benefit of the groupage to themselves as remuneration for their trouble.[1] Commercial firms make an extensive use of these agents, however, as they find it easier than dealing direct with the railway administration. The intervention of *groupeurs* naturally augments the duration of transport as well as its price.

[1] Discussing groupage in a further section of his book, M. Colson states:

"Occasionally praise has been given to groupage; it is said that it leads to the good utilisation of rolling stock, and that it facilitates the work of the companies in saving them the handling and booking of a number of small packages. But this work, which is not then performed by the Company, has to be paid for, and that at a high rate, by the public. It is hardly questionable that all the operations performed by the *groupeurs* can be performed as satisfactorily and at least as economically by the companies themselves; hence the intervention of a middleman can only be an extra expense in the carriage, and in addition it deprives the public of the advantage of equality and definiteness in the charges, which are ensured by direct dealing under the tariffs of the railway. Hence the best method of charges for the public does not consist in the development of groupage. When the financial status of the railway justifies a reduction of rates, such reduction should be arranged so as to benefit consignors and consignees; it should not be arranged so that the greater part of the reductions is necessarily absorbed by middlemen."

In general, the tariffs applied in Germany are a little higher than those in operation in France. The average rate per ton-kilometre is, however, a little lower, 4·38 centimes in Germany as against 4·53 centimes in France in 1906, or about 4 per cent. less. But the difference is not due to any inferiority of the rates applied to similar merchandise; it is due to the much larger proportion of low-rated heavy products in Germany, such as coal, minerals, etc. Without having the composition of the total traffic of the German railways, it is easy to prove this statement from the statistics of the Prussian State system, as these indicate that the influence of coal is sufficient to account for the difference in the average rate. The following are the figures for 1906:—

Country.	Traffic.	Ton-kilometres (millions).	Receipts Francs (Millions of).	Average rate (centimes).
France	Coal ..	4·378	140	3·20
	Other Goods (P.V.)	14·103	697	4·95
	Total ..	18·481	837	4·53
Prussian State	Coal	13·175	337	3·20
	Other Goods (P.V.)	19·184	773	5·04
	Total	32·359	1,110	4·29

With an equal average rate for coal to the French railways and a higher rate for other commodities the Prussian State railways have a lower general average, because the coal represents, taking the element of distance into consideration, 41 per cent. of their traffic and 24 per cent. only of the French railway traffic. As the remainder of the Prussian railway

traffic contains a larger proportion of minerals, etc., than the French traffic, this justification of the difference is about proved. The Prussian State system serves about three-quarters of the total German traffic and its tariffs are, perhaps, the lowest in the Empire. Of all the other State systems that of Alsace Lorraine is the only one on which the average rate is lower than that of France, this being due to the enormous mineral traffic from Luxemburg; in Bavaria, the average rate is equal to the French, in Baden a trifle higher, whilst on the other State systems it is considerably higher.

German passenger fares are, however, a little lower than the French, the average charge—not including baggage—being 3·20 centimes against the French 3·65 centimes, this representing a decrease of 12 per cent. The lower average in Germany is due to the difference in classes, as the 4th class in Germany offers passengers lower fares than any offered in France, and this advantage has been generalised by a recent revision. In Prussia, there have always been four classes for passengers. The price in centimes per kilometre in the four classes, and the proportion of passengers for each, in 1906, were as follows:—

	1st class	2nd class	3rd class	4th class
Single tickets, centimes ..	10	7·5	5	2·5
Return „ „ ..	7·5	5·625	3·75	2·5
Traffic proportion %	1·25	11·80	38·37	43·89

The surplus (4·69 %) being military traffic.

In Southern Germany, there were only three classes until recently, the third class fares being slightly lower than those applied in Northern Germany. Following the extension of the validity of return tickets to 45 days, however, the sale of tickets increased, and

it was subsequently discovered that frauds were being committed by persons who made several journeys with the same ticket which they had managed to retain. To put a stop to this abuse the German Government decided to abandon the issue of return tickets from April 1, 1907, and to this end four classes were established throughout Germany; the 4th class in Bavaria being termed 3rdB. It then became necessary to arrange single fares and these were fixed on a lower basis than that previously operative, the administration attempting to make good the loss by refusing to convey luggage free of charge, and by generalising the application of the excess charge on express trains. But the abolition of return tickets has partially eliminated the adaptation of the price to the value of the transport.

The reform caused but a slight reduction in the average fare. But this reduction was singularly accentuated in 1907 by the transfer of passengers to the lower classes due to the imposition of an Imperial tax on transport. This tax is a stamp duty on receipts and tickets, the tax varying according to the total charge of the transport. It represents quite an insignificant increase on merchandise in most cases but, for passengers, this augmentation is from 8 to 16 per cent. in the 1st class, from 4 to 8 per cent. in the 2nd class and from 2 to 4 per cent. in the third class. Tickets costing not more than 2·50 centimes per kilometre (4th or 3rdB class) are exempt from the tax. Owing to the application of this duty there has been a considerable diminution in the utilisation of the superior classes, the Prussian State railways thereby suffering a loss in receipts of 12,000,000 francs.

CHAPTER V

AUSTRIA-HUNGARY AND BELGIUM: GENERAL

AUSTRIA-HUNGARY.—The railway systems of Austria-Hungary have largely been created by companies under a State guarantee, whilst the lines constructed at the beginning by the State have been conceded to companies for the most part.

. . . . . .

The goods tariffs in operation throughout the country are like those of the German railways and are established in a similar manner. As a matter of fact, all the Central European railway systems are organised in a union (*Verein deutscher Eisenbahnverwaltungen*), the object of which is to unify the regulations in force on the various lines. In this union are included all the large German lines, the Austro-Hungarian systems, the Roumanian State railways, and the principal Dutch lines, the mileage of which totalled 98,000 kilometres in 1906.

The goods tariffs in Austria have recently been increased by a considerable augmentation of terminal charges, this being caused through the necessity of increasing the net product of the State railways which yields a very low return on the capital.

With regard to passengers, a reform was effected on the Hungarian State system in 1889, when all the old fares were replaced by a zone tariff, which has since

been modified. The journeys are now divided into zones, the lengths of which are 5 kilometres for distances of 10 to 25 kilometres, 15 kilometres between 25 and 175 kilometres, and 25 kilometres between 175 and 225 kilometres. Then there is a zone having a uniform price for all distances between 225 and 300 kilometres, another between 300 and 400 kilometres, and a further one for any distance exceeding 400 kilometres, up to and including a maximum of 800 kilometres. The fares present a series of levels. For the third-class they vary from 0·21 francs for distances less than 10 kilometres, and from 10·50 francs for those above 400 kilometres, the difference from one zone to the next being 0·525 francs for an average zone, a little less for the first and a little more for the last. The second-class fares are one and a half times and the first-class twice the third-class. By a special arrangement no zones operate through the capital, Buda Pesth, and it is therefore neces sary when going on a railway journey through that centre to take a ticket for the zone up to the city and another for the zone beyond the city. All reduced tickets, such as return tickets, have been abolished, and there is no free luggage allowance, whilst passengers on express trains have to pay a supplementary charge of 20 per cent.

This tariff system has effected considerable reductions in the extremely high prices formerly in existence, and has, in general, produced excellent results. The Austrian State Administration has established a similar zone system with greater decreases for longer distances but the zones are less extended and the differences are rather less marked between the three classes. This system of fares considerably simplifies the issue of

tickets, but when too large zones are adopted it leads to too sudden changes in the fare, which causes a poor apportionment of fare to the service rendered.

BELGIUM.—To avoid the operations of foreign financiers on Belgian territory the railways were originally constructed by the State. Concessions were subsequently made, but since 1870 the majority of the railways have been re-purchased by the State in order to avoid competition between the private lines and those worked by the State.

The taking over of the Belgian railways by the State was followed by a considerable reduction in the tariffs, which naturally compelled the private companies to effect similar reductions. Nevertheless, owing to the commercial and industrial activity of the country, the receipts fully cover the interest and amortisation charges of capital. In 1906, on a capital valued at 2,220,000,000 francs, the net product was 87,500,000 francs, or a little less than 4 per cent., which is not a high revenue for a system whereon the receipts are 63,800 francs per kilometre.

It is impossible, from the statistics, to ascertain the average fare per passenger-kilometre or the average rate per ton-kilometre, but detailed comparison between the Belgian and French tariffs indicates that the average of the Belgian rates is slightly lower than the French. The Belgian goods tariffs, like the German, are arranged so as to necessitate the groupage of small consignments; so far as rates are concerned they are somewhat similar to those in operation on the *Nord* system of France, which serves a district analogous to that of Belgium, and on which the rates are a little lower than on most other French systems.

Passenger fares in Belgium are lower than those on the *Nord*, but the difference is trifling; they are, however, not increased, like the French, by a tax. The traffic per kilometre is a little less and the tariffs probably a little lower, so that one might expect that the Belgian systems would have a higher *co-efficient d'exploitation*[1] than the *Nord*, as coal, metal and labour are certainly cheaper in Belgium than in that part of France. But the difference requires some explanation, as the expenses of the Belgian State railways are 64 per cent. of the receipts and those of the *Nord* of France 52 per cent. only. The obligations and responsibilities of the railway administration are not more onerous in Belgium than in France, and it would, therefore, appear that this is yet another example of the high cost of working under a State *régime*. In conclusion, it might be mentioned that the constant rise in the working expenses causes considerable discussion in the Belgian Parliament.

[1] Percentage ratio of expenses to receipts.

PART IV

GENERAL SURVEY AND CONCLUSIONS

CHAPTER I

DIRECT AND INDIRECT ADVANTAGES WHICH THE PUBLIC DERIVE FROM A REDUCTION IN THE PRICE OF TRANSPORT

Among the factors having an influence on the wonderful economic transformation which has taken place in modern times, and especially during the course of the nineteenth century, the facilities for transportation, and the reduction in its cost must be considered as one of the principal. For transport by railway does not cost, on an average, a quarter, not a tenth in many cases, sometimes not even a twentieth, of that which similar transport costs when effected by less perfect ways.

If the influence of production on a large scale has been to reduce the net cost of numerous commodities by the concentration of factories and manufacturies satisfying a wide demand; if competition is being established throughout the world between enterprises similarly constituted; if all quarters of the globe are to-day solidified; if civilised peoples are able to exploit regions remaining in the primitive state; if the products of distant countries are enabled to make up for the insufficiency of ours, to furnish the raw materials for our industries and to procure for us a state of universal well-being, all these factors are consequences of the extraordinary development of communications.

The same causes continue to extend their action by the introduction of perfected ways in regions where they have not hitherto penetrated; by the everyday realisation of progress in the working of older systems; and by the reduction of tolls which the development of traffic permits. Even in those countries already endowed with an extensive and perfect system of communication, the reduction of transport charges has certainly not reached its final state, for it has continued from year to year right up to the present day.[1] It is impossible, therefore, to say whether future technical progress will permit of further advancement in this direction, or whether, on the contrary, the augmentation of the cost of labour and the diminution of its output, on the one hand, and the growing requirements of the public in regard to the rapidity of transport, the comfort of travel and the responsibilities of the undertaking, on the other, will cause, in the near or distant future, a movement in the reverse sense. It is certain, however, that the reduction of charges, reckoning on the extremely low figures now in force, will not present the importance which such reduction has done in the past; and that it is solely the development of new countries that can henceforth effect economic transformations analogous to those we have witnessed.

Whether it is a question of a large or a small reduction in the price of transport, the effects resulting from it are of an analogous nature. Some are *direct*, others *indirect*. It is important clearly to define these expressions in order to avoid the confusion of language often noticeable in such matters. The term direct benefits is sometimes reserved for those which the

[1] It should be remembered that this edition of M. Colson's book was published in 1907.

transport undertaking obtains, and the expression, indirect benefits, is applied to those which the public derive from a reduction in the transport prices. This is an inexact definition, however, because some of the benefits derived by the public are very direct, and those are the most important.

The direct benefits to the public fall into two categories. In the first place, on all the consignments which would have been conveyed without the reduction in price, the public benefits directly by a sum exactly equal to the difference between the old and the new price. In the second place, certain consignments which would not have been conveyed at the old price, because their value was not equal to the essential cost, are transported directly there is a reduction in the price ; in each case there is direct benefit to the particular party in whose interest the transport has been undertaken. The benefit thus realised is, however, inferior, or at the most equal, to the reduction obtained in the price of transport ; but if the reduction is considerable, numerous consignments having a value intermediate between the old and the new price may be transported, and the total benefit which results is considerable.

The saving on the traffic formerly passing, and the excess of the value of the new traffic over its cost are, then, very direct benefits. To these it is necessary to add the indirect benefits which the public derive from the new road. The only benefits to which this qualification applies are those which result, not from the gain directly obtainable from the conveyance by the passenger and the consignor of merchandise but from the general prosperity which the creation of industries and of commercial relations develops,

these representing indirect consequences of the reduction in transport prices. Their existence is incontestable, but under certain circumstances their importance is apt to be much exaggerated.

This is what happens, for instance, when one considers, as a benefit caused by the reduction of the price of transport, the total of the remuneration which new enterprises pay to the capital or labour employed in them. One loses sight of the fact that, if these undertakings had not arisen, the capital and labour would probably have found employment elsewhere, perhaps less lucrative, but certainly not entirely unproductive. To declare that a reduction in the transport price has sufficed to render possible an undertaking which did not exist before is equal to saying that the capital and labour necessary for the undertaking were formerly employed less advantageously elsewhere, and that the saving caused by the reduction in the transport prices was necessary to alter their application. The economy, without which the change would not have been advantageous, represents the maximum profit which the new employment affords in relation to the old one ; thus it is incorrect to count this profit as an indirect benefit after having counted as a direct benefit the saving which constitutes it.

Indication should now be given as to the constitution of the indirect benefits due to traffic created by a reduction in price. The important point in this is not to include what is merely change and not benefit. As this doctrine is a source of frequent delusion, it will be well clearly to define our observations by comparing them with the statements made by an acknowledged authority and advocate of the doctrine of indirect benefits,

"Let us suppose," says M. Considère in a remarkable memoir, "that an ironmaster cannot successfully meet foreign competition unless the ore he uses costs at the most frs. 20 per ton; the value of the ore in question to this ironmaster, that is to say, the highest figure he can give for the ore will be frs. 20. If, therefore, he pays frs. 18 for it, including carriage, he will save frs. 2 per ton of ore, say frs. 6 per ton of metal, the production of which necessitates the consumption of 3 tons of ore; and if he sells this ton of metal at frs. 200 the difference between his selling price and the sum of frs. 54 paid for the ore, will represent the remuneration of labour and a certain interest on the capital. Such is sufficient to show how profit corresponding to all this production, which represents a value of frs. 200—frs. 54=frs. 146, depends on the economy of the transport, which is only frs. 6."

Without doubt, that would be true if the labour and capital which receive frs. 146 in remuneration and interest had, in default of this employment, to remain idle, or at least to receive decidedly smaller remuneration and interest. But if this were so, it is difficult to understand why the ironmaster should subject all his manufactures to this saving of frs. 6 on the carriage. He could have lowered his cost price by a little more than frs. 6, and offer a slightly decreased remuneration to labour and a slightly lower interest to capital, and these elements would have been pleased to have employment under such conditions. But he cannot do this because, by hypothesis, he ceases to be able to oppose foreign competition immediately his ore costs him more than frs. 20. With ore at frs. 20 he can just afford the remuneration and the interest necessary to draw

labour and capital to his industry; in these circumstances, therefore, he can pay remuneration and interest differing but slightly from that which the same labour and the same capital previously received in other employment. To say that frs. 20 is the limit for ore is, therefore, to say that the price of frs. 20 is the price which permits the industry to offer a current rate of remuneration to the labour and capital which it employs. These elements then do not owe their remuneration to the reduction in the price of transport, or at least, this reduction will only affect it in a slight degree. To add it to the direct benefits obtained by the reduction of the transport price is to reckon twice, and to consider as a creation, what is merely a simple transfer of productive forces.

In every case, where it is thought that there are immediate and considerable benefits having really the character of indirect benefits, we believe that a similar result will be obtained by submitting them to the same analysis, and that is why we warn the reader against the propensity to exaggerate the importance of indirect benefits. It is true that many authors have made calculations of the indirect benefits due to a reduction in the price of transport shewing very high figures, but the majority of them have included in the same valuation the direct benefits derived by the public from the reduction in the transport price and the indirect benefits which result from it.

The latter certainly exist: the saving and direct benefits realised on transport constitute new capital which fructifies in its turn; if the creation of new industries can only be made at the beginning by a transfer of capital and labour, fruitful competition between various employments gradually leads to a

noticeable increase in general production. These effects will occur in the future as in the past. Without being able to consider, in this regard, what slight reductions may be made to-day in the cost and duration of transport, comparable to those which have already shown enormous reductions and great accelerations, it can safely be said that the slightest progress is always of advantage. But serious disappointments are likely when, in the calculations which serve as a guide in these matters, too much account is taken of *indirect* and sometimes *problematical* benefits. When a transaction appears likely to yield directly more losses than gains, it is dangerous to count too much on making up these losses by indirect gains of which the existence and, above all, the real cause are often doubtful.

CHAPTER II

THE MEASURE OF THE UTILITY OF NEW LINES OF COMMUNICATION

It is especially in connection with the construction of new lines of communication that it is necessary to bear in mind the considerations outlined in the previous chapter. This construction absorbs a large amount of capital and labour, such expenditure being essentially for the purpose of reducing the price of transport. But if this employment be not directly productive of benefits bearing a suitable relationship to the cost incurred, it is doubtful whether the indirect benefits will compensate for the lack of direct benefits which, in a more congenial employment, would be derived from the same means. It should not be forgotten, however, that whatever this employment may have been, it would not have produced direct benefits without also producing indirect benefits obtained by the development of every prosperous enterprise.

It is important here to remark that it is not at all necessary for receipts to be productive for a work which facilitates transportation to ensure a useful employment of capital. The legal answers given to the question of reasonableness of tolls vary in accordance with the time, the place and the condition of the lines. But when the public powers or even private enterprises

establish lines of communication which do not obtain tolls sufficient to cover their expenditure, it does not necessarily result that the lines are not rendering service of which the value exceeds the expenditure involved. In order to say whether the enterprise is a utility, therefore, it is necessary to ascertain whether the value of the service obtained by the public is superior, equal, or inferior to the expense involved: to ascertain whether the establishment of such a service will be remunerative to those who hope to profit by it is quite a separate question.

Leaving out of question this point of view, however, consideration must be given to the true utility of a new line of communication. It is certain that this utility usually results from a decrease of the net cost of transport consequent on the technical superiority of the new line over the old one. For instance, if the new line, like the old one it replaces, is freely opened to the public without the exaction of a charge representing the toll, the superiority of the former would be especially noticeable. On all traffic formerly passing by a less perfect means of communication the public would derive a direct benefit equal to the diminution of the special expenses caused by the transport. If certain traffic which could not pass on the old line commences to pass when the new line is opened, it is because the provision of the new line and the reduced cost of transport have created the traffic; these supplementary transports have, then, a value inferior to the old net cost, but superior to the new net cost of transport, and the benefit produced is the difference between their value and the cost of transport by the new line.

To the money economy which the public derive

from this reduction in price must be added the benefits which result from the rapidity, regularity and safety of transport. In some cases these are of considerable importance. When, for example, short-distance urban transport is considered, the fact that the public know the precise points from or to which they may be conveyed by electric traction with rapidity and safety, is as much a benefit as the advantage of reduced fares, which such a constant employment enables the transport undertaking to offer. If the total benefit thus derived by the public is superior to the annual expenditure of the line, *i.e.*, the interest and redemption of capital, and the expenses of working and administration, the working of the undertaking may be considered advantageous, whilst in the contrary case it represents a burden. In the first instance, it gives to the users more than it costs the shareholders ; in the second, it costs the latter more than is given to the former.

Where tolls are charged the situation is exactly the same. Through the exaction of these charges the *concessionnaires* compel those who use the lines to share the benefits with them, but these benefits only follow from the value of the transport effected and its additional net cost. Suppose P to be the total cost of certain transports, including toll and p the additional net cost by the old route, and that P^1 and p^1 represent similar elements by the new route. The benefits obtained by the consignor through the opening of the new line will be $P - P^1$; at the same time the new line will derive a benefit of $P^1 - p^1$; but the line which loses the traffic also loses the benefit which it derived, viz., $P - p$. The final result to the community, therefore, obtained by deducting this loss from the gain previously indicated represents a

benefit, $(P - P^1) + (P^1 - p^1) - (P - p) = p - p^1$, exactly equal to the difference in the additional net cost.

The result will be the same, though the reasoning is a little different, when consideration is given to the benefits derived from traffic which passes on the new route, and was unable to pass on the old one. These transports are those whose value V, was inferior to the total cost P, and superior to the total cost P^1, so that whilst there was no incentive for the traffic previously to pass, there is some interest to-day. It would appear, then, that it is the difference between P and P^1 and not p and p^1 that renders possible the transport of this additional traffic. But it should be remembered that in a well-studied system of rates the total price will decrease to the level of the additional net cost without toll if such is essential to effect the transport. It is, therefore, always the additional net costs (p and p^1) on each of the two lines that really represents the extent to which the total price on each may decrease. If the new line does not reduce the net cost there is no new facility to attract the traffic by a reduction in charge; a reduction could be effected with or without the new line, and it would certainly be more simple to effect one on the old route rather than spend a considerable capital to create a new line which is no better able to reduce tariffs than the old one. It is, then, according to the degree in which the new line, by effecting a reduction in the net cost of transport, conveys the traffic without loss, at prices which would not cover the costs on the old route, that the new works are really the *cause* of reductions generative of traffic.

The real measure of the utility of a new line is, there-

fore, (1) the difference between the net costs of transport on all traffic that could be conveyed without loss by the old route, and (2) the difference between the net cost and the value of transport by the new route on all traffic that could not bear the net cost of transport by the old route. In the latter case, it should be made clear that the difference is necessarily smaller than the difference between the net costs of transport by the two routes. If the total of these benefits exceeds the annual costs of the new line, the operation may be considered advantageous, whilst, in the contrary case, it represents a loss.

It is important to remember that when a second route is created, the costs of the old one are not suppressed, but those of the new line are added to them. It is not, therefore, necessary to measure the utility of the new line by the utility that it secures to all traffic, but only by the utility of the new traffic and the economy realised on the traffic diverted from the old route. Even if the old line should have become too congested for the traffic, it is certain—with the exception of a few rare cases—that it would cost much less to augment its capacity than to create a new line. It is, therefore, the difference between the expense involved according as one or other of these solutions is adopted which ought to be considered in the calculations when an attempt is made to ascertain the utility a new line would have, the provision of which will render unnecessary the construction of large works on the old line.

The provision of a new line is sometimes contemplated, even when it can have no technical superiority over the existing line, as a means of compelling the holder of a monopoly to accord to the public a portion

of the undue profit he obtains. If the new line is constituted in a similar fashion to the old route, the probable result would be the reconstitution of a dual monopoly which would attempt to derive greater receipts, as it would have a larger capital to remunerate, and would try to make up for the losses due to previous competition. If the State keeps the competing line in hand, however, it could insist on the reduced tariffs being maintained, at any rate until it was necessary for the rates to be augmented to cover the expenses. In any case, before sanctioning the construction, the Public authorities should ascertain that there is no cheaper method of attaining the same end. The creation of lines which do not improve the technical conditions of transport, and which are only constructed from tariff considerations, is a weapon that may be useful at times, but it should be used only when it is impossible to obtain the results without a double use of capital which represents waste.

These considerations have carefully to be considered when there is a proposal to construct, for example, a direct line between two points already connected by railway. In many cases this new construction could be avoided, for, as we have indicated (Part II., Chapter II.), those who utilise the line between Marseilles and Cette have profited in the fact that the P.L.M. have been compelled to afford reduced charges, by means of a computed distance, in order to prevent competition.

As to the question of opening a navigable route in contiguity to a railway one ought to consider whether the navigable route represents a superior instrument of transport, or merely a means of ensuring a reduction of

the tolls such as could be realised in some other way if really essential. The question whether it is better to build a railway or a canal, where there are no lines of communication, never occurs; it is generally admitted that a railway is indispensable as it is only by this means that the celerity of operation can be assured. As long as a railway suffices for the traffic therefore it would be absurd to establish a navigable route in contiguity thereto as, obviously, a second capital would be essential to assure a more imperfect service than that offered by the railway. Even if the railroad is unable to cope with the traffic, the expense necessary to augment its capacity by tripling or quadrupling the roads should be much inferior to that requisite for the establishment of a new line; railway extension, then, in such cases, is the only economic arrangement. It sometimes happens, however, that railway extension is hindered by constructional considerations which render the essential expense prohibitive; in such cases it is necessary to establish a line following another route. If this line be a railway, it will give to the new districts served an express service which a canal cannot provide. A waterway should, therefore, be preferred only when it constitutes a much cheaper instrument of transportation from the standpoint of establishment expense.

The only case where a navigable way does not cost as much as a railway is where there is a river naturally available for navigation, *e.g.*, the Rhine and the Elbe. But, on the Seine, for instance, extensive canalisation works have had to be executed, these costing about 108 million francs between Paris and Rouen to connect towns which are only 134 kilometres

apart by railway; this natural route thus cost more than 800,000 francs per kilometre. It is perhaps true to say that an exceptionally large current of traffic passing between localities situated on the banks of a large river may be the most advantageously conveyed on this navigable way. Its improvement, however expensive it might be, is practically the most economical way to answer the public requirements, as once the work is done the capacity of its transport is practically unlimited; but the capacity of a railway having four roads is similarly unlimited, and the stations necessary for the forwarding and receiving of merchandise are not more expensive than ports. And the railway has the additional advantage that it serves without transhipment the whole of the district, a great part of which is quite inaccessible to the waterway. In any hypothesis, therefore, the same amount expended in railway construction will render more service than if it is expended on navigable ways—with the sole exception when, by a comparatively small expenditure, it is possible to augment considerably the conditions of navigability on an existing canal or river.

If the decrease obtained in the net cost of transport by the creation of shorter routes or navigable ways is often problematical, there can be no doubt, on the contrary, that a considerable decrease is effected when a "specialised" way is established in those countries where more primitive ways of transport have alone existed as, for example, by the construction of a railway route in a district where transport was previously effected by carriers or animals. The effect is more striking when the railway penetrates, as the pioneer of civilisation, into regions which do not

possess any means of communication. The enormous economy effected on long-distance transport allows the traffic rapidly to develop all the time charging tolls which become remunerative from the moment that colonisation has made marked progress. In the presence of such radical transformations direct benefits and even indirect ones often become extremely important.

There is a tendency to attribute similar effects to the short railways serving localities of small resources, the only ones which to-day remain to be constructed in the older civilised countries. When the question is carefully considered, however, it is easy to see that the economy procured by such a road to the majority of the traffic carried over it is but little. Firstly, the tariffs of these railroads are higher than those of the main lines and the advantages which they procure in the cost of haulage, are consequently but small. Secondly, the cost of cartage must not be forgotten, for this, added to the cost of railway transport for short distances, is a material consideration. When a farmer, whose farm is 25 kilometres distant from the main line, has to cart his products 8 or 10 kilometres to a branch line station from which they have subsequently to be conveyed 20 or 25 kilometres before reaching the main line, the economy resulting from the diminution in the journey effected by his carts is almost all swallowed up by the railway charges, and the real benefit for him is therefore negligible. Consequently it is only those directly served by small branch lines who derive any considerable advantage.

In addition to the material economy offered by the railway, however, its presence gives a certain added value to business transactions. Traffic which could not pass prior to the creation of the line is not the

only element to flourish. There is other traffic, the value of which is much higher than the cost of transport by the old method of communication, which would never have developed without the construction of the railway. This is a point that should receive attention, as there is a liability to misunderstanding in the consideration of economic questions if one considers that an operation will be accomplished provided it is practicable and lucrative. Habit is in most cases a great obstacle to progress; to sell a product on the most advantageous terms, one has to understand how to interest the buyer, and how to develop the most lucrative exchanges between different countries. It is necessary similarly to attract clients to the transport highway by some sort of publicity. The presence of a station in a district is the most useful advertisement in this regard. Take the arrival of goods at such a station for example; the importance of the facilities afforded for the storage of traffic in the neighbourhood of that station is often greater to the consignee than the economy on the cost of cartage. There is, therefore, a benefit in the presence of a railway which must be added to that procured by the reduction in transport cost, and which must not be under-estimated. But care should be taken not to exaggerate the importance of it, as experience unfortunately shows that the elements of latent traffic are but slowly developed, and it is by making too high an estimate that mistakes are often made in calculating the probable product of branch lines.

In practice, many of these branch lines—even with their high tariffs—hardly cover the cost of operation. It is certain, however, that they act as feeders to the

main lines, and give them additional traffic which tends, directly or indirectly, to lower their charges. Nevertheless, after taking due account of this element, the receipts are often inferior to the interest on the capital expended in construction, and when the difference is considerable it is doubtful whether it is covered by the direct or indirect benefits derived by the public.

It is extremely difficult to estimate in advance the probable importance of the traffic of a new line, or of the traffic which it will divert from older lines. A careful study of local circumstances and of lines in other districts where conditions are similar, can only give useful indications in this regard, whilst the employment of general *co-efficients* is deceptive. To fully appreciate the utility of an enterprise, consideration must be given to the probable benefits which the traffic will procure for the undertaking, on the one hand, and for the public on the other ; it is very necessary, also, to add the benefits which the State derives from the imposition of duties, and to deduct the losses which the older routes will suffer through the diversion of traffic. The utility of improvements on an existing line should be measured in the same fashion, that is to say, by comparing their cost with the economies they are designed to effect.

This is the only proper analysis by which to measure the utility of a proposed work. Even when such appears of great utility, it is important to ascertain —before proceeding with the construction—whether it be the most advantageous method of attaining the end. This is a very important matter, especially when the object is to free the public from some monopoly or burdensome privilege, for it is often

recognised that the same result could have been procured at less expense by modifying the *régime* of existing lines rather than by creating new ones. This principle is exemplified in the P.L.M. example (Chap. II., Part II.), where the establishment of a computed distance (*distance d'application*) between Marseilles and Cette effected a result similar to that proposed as the reason for constructing a direct route.

CHAPTER III

EFFECT OF THE PARTIAL OR TOTAL ABANDONMENT OF TOLLS

THE confusion between the technical advantages and the financial effects are especially noticeable in the views expressed on the subject of navigable routes. It is a financial question which has made these ways to-day the most economical to the public. An attempt has been made to show that neither from the point of view of the cost of transport, nor with regard to establishment expense have they any advantage over railways. But in most countries the Legislature has accorded a considerable advantage to people living on the banks of canals or canalised rivers by freeing such canals or rivers from tolls. Is this exemption justified? Should and could the exemption be applied to other modes of transport? These are the questions to which consideration will now be given.

We must first remember that roads have to be placed out of the question. The suppression of tolls on the roads is everywhere realised for two obvious reasons. The first is, that by reason of their development and the shortness of the journeys usually effected, the exaction of tolls would not be possible except by the provision of a great number of surveillance posts, as intolerable as they are expensive to the public. The second reason is, that all parts of the

territory are provided with roads which all people may use, and there is no injustice in imposing a general tax to meet the expense of maintenance and new construction. Only in those countries where roads are few and where these will be multiplied but slowly, could tolls still be imposed.

Do the same arguments apply in connection with more perfect lines of communication, railway or canal, which form limited systems and are used for more important but less frequent journeys? If the question were complete, if the *régime* of navigable routes were similar to that of railways, there should be no hesitation in supplying an answer; heavy materials could and should be almost completely free from tolls, whilst tolls should disappear on other products. This is the conclusion to which one is inevitably driven in all studies of transport problems.

It has previously been explained that tolls do not diminish the services rendered by the ways of communication, but only modify the distribution of the advantages procured as long as they do not reach a prohibitive sum. But they constitute a real prejudice to the community when they hinder acts of conveyance of which the value exceeds the net cost. In practice, it is impossible to make each portion of the traffic pay a toll calculated in exact accord with its value. It is necessary, therefore, to take general measures. Under these conditions, it cannot be doubted that the total abandonment of tolls on merchandise in great demand but of little value—the distribution of which depends entirely on the cost of transport—would render possible certain exchanges that the application of a higher charge would have prevented, and would, in consequence, produce useful effects. For products of greater value,

however, which can generally pay a higher charge, it is only in exceptional cases that the traffic is augmented by a reduction in the toll.

It is certain, for instance, that the development of coal traffic is to the public advantage. But for merchandise that has cost a few francs per ton at the point of production, the price of transport represents a moiety of, say, three-quarters of the total price at the point of consumption. The well-managed railway companies offer facilities for conveyance at prices almost bordering on net cost, by reducing the toll a little, in order to assist the development of industrial or agricultural products in the districts they serve. It is quite natural, therefore, that navigable routes are often free of tolls on these traffics, and the public powers make use of this and all other means of action in order to force the railway companies which do not see the utility of it to an analogous sacrifice.

The situation is quite different for products of greater value. For corn, wine, and iron which have a value of 150 to 200 francs per ton, a toll of a few francs on long distances is quite reasonable. For cotton, linen and paper which have a value of 1,000 to 1,500 francs, and for yarn, etc., which has a value of several thousand francs, higher tolls are not at all inconvenient. It would doubtless be preferable for these industries to be exempt from such tolls, and an intelligent *tarification* will reduce them if commercial circumstances necessitate this course, particularly when there are many markets to which the traffic may be diverted. But in most of these cases the transport prices exercise only a slight influence on the traffic, and there is no reason why those who use the public roads, canals or railways, and effect transports

of this nature, should not pay their share of the expense involved in the provision of these routes by means of tolls, not simply nominal but *en rapport* with the character of the goods. Let us suppose, for instance, that with the exception of goods enumerated in the lowest class of the general railway classification,[1] a charge varying from 1 centime for the 5th class to 5 centimes for the 1st class, was established on the navigable routes, which charge would still be much inferior to the tolls shown for the same products in the lowest railway tariffs. If, under these conditions, the water route could not retain the traffic on account of its technical inferiority, this should not take away the heavy traffic which it could legitimately claim as its own.

But it is not this legitimate distinction, founded on the nature of the traffic, that has been made : it is another and a quite inexplicable distinction between the different regions of France. On the navigable routes all tolls have been abandoned even on the most valuable goods ; on the railways substantial tolls are still chargeable on cheap goods. But the navigable routes only serve certain parts of the country, and it is therefore obvious that the placing of these ways free of charge at the disposition of certain persons is to give them a favour extended even to valuable traffic for which it is absolutely unjustified.

The natural result is that those people who are not in the immediate neighbourhood of these favoured routes immediately demand the provision of them, and this has caused the creation or the transformation—in districts already very well served by railways—of routes

[1] It should be noted that the railway classification in France —and most other Continental countries—is numbered, as to classes, in reverse order to the British.—C. T.

on which the net cost of transport will always be higher than on the railway. But from the moment when it is not the superiority of the line itself; where it is legislation which has established the difference, there is no *à priori* reason why the same advantage should not be accorded to the railways. It should cost less to suppress the toll on the existing route of communication than to construct another route exempt of these charges, in order to compel the former to reduce its charge. It is true that railways, in general, are conceded, and the authorities cannot insist on the abandonment of the tolls, but the redemption of these tolls would often cost less than the construction of a competing route. Taking an average of 35,000 francs per year per kilometre of actual distance, which represents the interest on capital and the maintenance of the Seine improvements, the *Ouest* company could have effected reductions in charges at least equal to those procured by the navigable route, and could still have profited, on the diverted traffic, by an amount sufficient to reduce considerably the expense incurred by the State in the payment of guarantee interest.

The idea of such an arrangement appears inadmissible, and the whole of France would have protested if the authorities had announced their intention of making such a sacrifice in order to reduce the cost of transport on the line from Paris to Rouen. This, however, is the effect of making the navigable route exempt of toll. No Budget would be sufficient to provide the whole of France with a system of canals doubling all the railways. But when navigation exists only in a few districts it creates for those districts an advantage over those served only by railroads, as it provides routes

exempt of tolls and more, since, through an indirect consequence of this first privilege, such districts profit by a considerable decrease in the tolls charged on the railways.

Whilst exempting the navigable routes of tolls, the railways have been forbidden, in some cases, under pretext of equality, to make the reductions necessary to retain the traffic. This is a quite unjustifiable policy. It is naturally to be expected that the railway companies, which have heavy expenses of capital to remunerate, will reduce their tariffs to the level of the navigation prices exempt of toll; when they are forbidden to reduce their charges to the competing point this does not destroy the inequality between different parts of the country resulting from the fact that only a few districts are served by navigable routes; the traffic is artificially forced on to the navigable ways even when their net cost of transport is higher, as the companies are prevented from attracting the traffic to their roads by an equivalent charge which would cover the transport cost and still leave a profit. The railways do not compete unfairly with navigable ways which forward almost at net cost prices, inasmuch as they receive considerably more than the net cost of transport, and are not responsible for the unequal treatment between the different districts to which they submit, but which they did not create.

Once an established *régime* in a country arrives at a certain point of development, it is very difficult to modify it. The advantages accorded to the people living along navigable routes, whether legitimate or not, have served as a basis for the creation of many industrial establishments, and it is, of course, difficult

to overthrow their conditions of existence. But it would hardly affect them if an attempt were made to modify the advantage obtained by valuable goods whose privileged situation is ridiculous. The only way to effect an improvement is to impose a uniform *régime* on all lines serving the heavy traffic. This *régime* should reconcile the financial necessities and the commercial requirements, that is to say, should exact tolls conveniently graduated on goods above a certain value, and permit the complete exemption of all heavy traffic.

CHAPTER IV

EFFECT OF A TARIFF REDUCTION ON RECEIPTS

It is often asserted that a reduction in tariffs will necessarily augment the receipts, and as public opinion is rather inclined to agree with this statement it is advisable carefully to consider the question.

Experience shows that decreased tariffs do, in fact, cause a development of traffic sufficient to give higher receipts in all those cases where the rate to which the reduction applies has frequently been a prohibitive one. But it is very rare that the result is financially beneficial when one considers a general reduction in the tariffs, especially if the reduction be applied to all the traffic in the same proportion. In this case, therefore, it is evident a decrease on many tariffs is unnecessary as the old prices did not hinder the development of traffic; in other cases, an equal decrease is insufficient, for want of descending to a level which alone would make possible the movement of the impeded traffic. Further, the development of traffic does not always produce receipts sufficient to make up the loss on the traffic previously passing.

Examples to the contrary are, of course, often cited. By a comparison of the gross receipts realised some years after a tariff reduction with the receipts procured prior to the reduction, it may be observed that the former are the higher, and from this the conclusion

is drawn that the tariff reduction has been advantageous. Two important points are, however, overlooked: the first is that in a progressive country traffic normally grows in value, and that, to judge the effect of a reduction, the receipts realised five years subsequent to the reduction should be compared, not with the receipts of the year prior to the reduction, but with those receipts plus the increased value of the traffic which might be expected after the five years; the second is that, in order to realise the same gross receipts, it is necessary to transport more traffic, this naturally necessitating greater maintenance and operating expenditure, so that to obtain the same net product it is essential to have an enormous augmentation of traffic. A few examples of the effect produced by a reduction in tariffs will illustrate the importance of the principles enunciated.

The most typical example is, perhaps, the reduction in passenger fares effected in France on April 1st, 1892. Before that date the State imposed a tax of 23 per cent. on the cost of tickets, and this tax was reduced to 12 per cent. At the same time, the companies, in virtue of obligations contained in the Convention of 1883, reduced their prices for 2nd class single tickets by 10 per cent. and 3rd class single tickets by 20 per cent.; return tickets were also accorded a reduction, the 2nd class by 4 per cent., and the 3rd class by 15 per cent. In the aggregate, the decrease—calculated on the traffic of 1891—represented 75 million francs, or 17 per cent. of the total amount paid by the passengers. The reduction was divided between the Treasury and the companies, but, from an economic point of view,

the result must evidently be considered on a basis of total receipts, because the fact that part of the price paid at the railway booking office is government tax, and another part cost of transport is a matter of total indifference to the public, and has no influence on the augmentation of traffic obtained by a decrease in price.

The three years precedent to the revision (1888 to 1891, not including the Exhibition year of 1889) were years of average prosperity, without any important modification in tariffs, and the annual progress of the traffic was 313 million passenger-kilometres, whilst the growth in receipts, including government duty, amounted to 13 million francs. From 1891 to 1893—the revision being in 1892—the traffic increased by 1,716 million passenger-kilometres, this being 1,090 millions more than the normal progress of two years, but the total receipts decreased by 15 million francs, instead of increasing by 26 million francs, this representing a loss of 41 million francs on the normal value. Taking the following ten years, 1893 to 1903, the annual increase of the traffic was 333 million passenger-kilometres, and the receipts nearly 13 million francs, this being rather inferior than superior to the average shown before the revision; it can, therefore, be said that the tariff reduction represents a definite loss on the gross receipts equal to the loss involved when the reduced fares were put into operation. But the abnormal increase of traffic to which the reduction has given rise, in addition to the usual annual value, has been about 12 per cent. of the acquired traffic, and the receipts have considerably increased. On lines where trains run practically empty, the growth of traffic does not, of course, cause any appreciable increase in expense, but on the main lines

where the accommodation provided is strictly in accord with the number of passengers the expenses have considerably increased.

As the Treasury previously received a fifth part of the receipts, and has foregone a little more than half of the decrease, it has sustained the loss on the gross receipts. The companies, however, have realised receipts almost equal to those of previous years; their part of the benefits accorded to the public consists only of the increase in rolling stock and operating expenses, these being certainly of great importance, but exceedingly difficult to estimate.

As an excellent example of a revision in passenger fares which has given good results, mention might be made of that effected, by the adoption of zone tariffs, on the Hungarian State system in 1889. In 1875, Hungary increased the passenger tariffs by a tax of 20 per cent., which brought the fares much higher than those in operation elsewhere. The suburban traffic, charged at a uniform rate for a minimum of 8 kilometres, was of little importance, whilst long journeys, the cost of which exceeded the resources of most of the inhabitants of such a poor country, were but infrequently made.

The revision of the tariffs (independent of the special form given to the prices calculated per zone), was characterised by four principal features:—

1. The creation of reduced suburban fares.

2. An enormous reduction in long distance fares, the initial tariff of 1889 only comprising one zone with a uniform price for all distances exceeding 225 kilometres.

3. The institution of competitive fares against

lines not belonging to the State, and against the port of Trieste to the advantage of Fiume.

4. The abolition of return tickets, special tariffs, free conveyance of luggage, etc.

The effect of the reduction is exceedingly difficult to calculate on account of these various modifications, but it has been valued by the Director of the State system at 25 per cent. on the old fares, the tax not having been reduced.

To explain as clearly as possible the effect of competition, it is necessary to compare the figures previous to the revision with those of the year following the purchase of the system with which competition was most active, that being the Austro-Hungarian Company, bought in 1891. By adding its traffic to that of the State lines, the following table will indicate the progress on the whole of the lines from 1888 to 1894 :—

	Number of Passengers. per cent.	Receipts, per cent.
1st zone and suburbs	650	232
Zones 2 to 12	40	10
13th, 14th and 15th zones	300	186
Total	256	65

It will be observed that on the very short and very long distances the traffic has developed enormously, whilst on the intermediate distances the average yearly value is only a little superior with regard to traffic, and a little inferior with regard to receipts than would naturally be expected in a new country making rapid progress. As the trains were little utilised before the revision the huge development of traffic has not caused a proportional augmentation of expenditure, and the net product has slightly increased. The

Hungarian State system, however, recognised that it had gone too far in reductions on the extreme distances ; in 1896 and in 1903 it altered and increased the suburban fares on the one hand, and subdivided, on the other, the last zone by three, so as to increase the fares from 300 kilometres, and to establish uniformity of charge only for distances exceeding 400 kilometres. These increases have not been without effect ; that of 1896 represents about 6 per cent. of the total receipts ; the one of 1903 increased the fares for distances between 20 and 25 kilometres by 17 to 25 per cent., and those for distances exceeding 300 kilometres by 10 to 33 per cent. Between them they have caused an insignificant diminution of the traffic, and an increase in receipts about equal to the increase in the fares.

In general, the revision of passenger fares in Hungary must be considered a successful policy, particularly as it removed, in respect of very long and very short distances, the lack of concurrence between the tariffs and the requirements of the country. The Austrian State administration attempted to institute a similar zone tariff—with large reductions—in 1890, but as the old fares were not prohibitive, it retarded instead of accelerating the favourable progress of the receipts ; as a consequence, the fares were considerably increased in 1892 and 1895. Similarly, the Belgian State system effected considerable tariff reductions in 1866, especially for long-distance traffic, and suffered a loss which, though insignificant on the gross receipts, has had a noticeable influence on the net product.

It is evident from the foregoing examples that general reductions in passenger fares only develop receipts sufficient to compensate for the decreases

in those cases where the old fares were prohibitive for a great portion of the traffic; where they were not justifiable through special circumstances they have caused losses. The elasticity of passenger traffic, however, presents a character much more general than that of goods traffic; whatever the rate charged, products only circulate when there is a commercial reason for the transportation, whilst the pleasure of travel, even without any specific purpose, exists everywhere, and will be more satisfied when fares are reduced.

. . . . .

The expensive results of general revisions, as indicated with regard to passengers, would most likely be equally expensive in regard to merchandise; but general revisions in goods rates are very rare, as the traffic is, of course, subdivided into so many branches that reductions are very seldom applied to all at the same time.

An instructive example is to be found in the example of the Belgian State system, whose kilometric receipts considerably increased after the revision of rates in 1859; but the augmentation, instead of being more rapid than formerly, was less so until the State system incorporated the lines of the Hainaut coal-district. These had a much higher kilometric receipt than the old lines, and consequently caused a considerable increase in the average receipt. In reality, the Belgian State system obtained a large increase in receipts when its transit rates were reduced to the advantage of the port of Antwerp, which is better situated than rival ports for commercial relations between parts of France, Germany, Switzerland, and over-sea countries; the results of the rates specially instituted

in order to take advantage of this favourable geographical situation have been excellent, whilst those of the general reduction of local tariffs still remain problematical.

It is only in connection with *grande vitesse* traffic that a general revision of merchandise rates is sometimes effected. A great reduction in the rates for such traffic was made in France at the same time as the reduction in passenger fares; the State completely abandoned the tax on the transport of animals, foodstuffs, etc., whilst the companies made important reductions in the tariffs. The amount of the decrease —calculated on the traffic of 1891—represented about 16 million francs for the State, and 9 million francs for the companies on a total receipt of 102 million francs, including the tax, which is about 25 per cent. Altogether, the annual progress of receipts on goods sent by *grande vitesse* increased from less than 3 million francs (including tax) before 1891 to more than 6 million francs after that date. Even admitting that part of the traffic has simply been transferred from slow to fast freight (mainly on account of the change in denomination of the tariffs applied to the traffic), there can be no doubt that the loss on the total receipt, tax included, has been compensated for by the augmentation of the rate of gain in less than ten years, and that the final result is advantageous.

General reductions have nearly always caused losses if the traffic concerned did not include a considerable quantity on which a special reduction was justified by commercial requirements. On the contrary, reductions applied specially to certain traffic and determined after a careful study of the situation, generally prove of considerable advantage. Thus, in 1892, the *Orleans*

company, observing that the difference between the price of grain and flour on the different markets of its system always remained inferior to the prices resulting from its schedule, decreased the rates to the extent of 32 per cent. for 200 kilometres, and 41 per cent. on 500 kilometres, without disturbing the rates for short-distance traffic; this reduction was designed to render the transport of grain to the south more profitable to the producers than the transport to Orleans or Paris, markets which were nearer. Between 1892 and 1896 the traffic passing between 200 and 400 kilometres was three times as great, and that conveyed over 400 kilometres, ten-fold. Similarly, the considerable reductions effected in 1894 in the rates on wines over the *Midi* to Paris, in order to enable wines produced in the south of France to compete with the foreign wines introduced when the phylloxera ruined the French vineyards, and thus paralysed the wine industry, have immediately given an enormous benefit. Such special rates applied to particular traffic, and answering to local conditions, to which it is always easier to adapt rates with precision, often give results more advantageous than scales.

The most striking instance of reductions in merchandise tariffs is, however, to be found in the United States during the years 1872 and 1899, when the average receipt per kilometric ton decreased from 6.5 cents to 2.57 cents. This large decrease was almost entirely caused by the application of special rates in order to attract the traffic susceptible of development, whilst the rates on local traffic remained much higher than they are in Europe. The reduction of the average rate thus effected has been

accompanied by an increase in the gross receipts from 2,400 million to 6,800 million francs, and an increase in the net product from about 860 million to 2,300 million francs. The augmentation has been nearly proportional to the extension of the railways during the same period, these having increased from 93,000 to 302,000 kilometres. Competition has, without doubt, often played a considerable part in the reductions, but the points where competition flourished were naturally those where the abundance of possible traffic attracted the attention of several companies. It is quite evident that the increase in population (41,000,000 to 74,000,000), and the great development of America have been the reasons of the increase in traffic, but the reduction in the price of transport between the new centres of production and centres of consumption or export, has specially contributed to the rapid population of the western regions. This reduction has, moreover, been especially facilitated by the liberty of *tarification* which permitted the railway companies to effect huge reductions in order to develop new traffic without interfering with the tariffs in regions in a more stable economic state.

It is only through marked reductions that traffic can be developed, and it is, therefore, necessary to concentrate the reduction on a small number of articles in order to avoid too great financial risk. A reduction of several million francs divided over the whole of the traffic of a large system, and reducing in an insignificant proportion the transport cost of each unit, does not lead to an immediate change of business relations or habits of the public, so that it takes a long time to make its influence felt on the traffic. But the same reduction, concentrated

in order to reduce by one-third or one-fourth the rates of certain commodities, causes development in this direction, and offers the best hope of obtaining sufficient receipts to make up for the reduction.

We thus arrive at the conclusion that a system of rates sufficiently elastic to respond to the varied requirements of commerce is the only one that will obtain the requisite revenue without interfering with the due development of traffic.

CHAPTER V

STATE V. COMPANY MANAGEMENT AND STATE CONTROL

In connection with lines of communication, and more particularly railways, it is the necessity of organising on a commercial basis, and of reconciling, the two characteristics presented by the services they provide that renders most difficult the question as to how far they should be placed under public control. From one point of view, the railway business is essentially an industrial enterprise that has to work in accordance with the necessities of its traffic but, on the other hand, the creation of railways is a matter of general interest. They can only be constructed as public works, and the general security imperatively requires that the authority which creates these routes and organises the service of transport should be under public control to some extent. Thus the question of the railway *régime* presents two co-related aspects.

The most determined opponents of the policy of State interference cannot deny the necessity for State intervention, so far as the conditions under which traffic is transported are concerned. On the other hand, it is impossible to count on the play of competition to regulate prices, to limit to a reasonable remuneration the benefits accruing to the *concessionaires* of railway routes, and to compel them to share with the public (by the establishment of improved

services or by tariff reductions) any prosperity they may enjoy. A certain control by public authority, therefore, exists everywhere. Should this interference go so far as to take complete control of the railways, and thus entirely to exclude private enterprise? On the other hand, can the State control a private management *régime* in a satisfactory manner? If this *régime* be permitted, what should be the character of the control exercised? These are the questions remaining for final consideration.

Such reflections suffice to show that it is unjust to accuse all the advocates of State railways of socialistic tendencies. The working of railways presents characteristics sufficiently peculiar to cause many people to believe that they should be a public service, and this belief does not necessarily imply a desire to extend the State *régime* to other industries. But because railways cannot be considered purely as private enterprises, it by no means follows that the government must take over their management.

Favourable comment is often passed on the energy and activity of a management inspired by private interest as distinct from the routine of a Government department. But on this point there is no *à priori* proof, or proof by later experiment, of any great difference between private companies and the State service. On one side as well as the other are to be observed large organisations directed by a salaried staff. In each case interest finds a stimulant in the same considerations of duty, on the one hand, and of advancement and success on the other. Energy and activity or, on the contrary, routine and mediocrity, are to be found in both services.

It is more in the principles of management that

certain differences are to be found. In the railway industry it is necessary to cultivate the capability of immediate response to commercial requirements, and to avoid any arbitrary favour or any inequality of treatment being applied to similar situations. A State administration naturally tries to retain uniformity, and a company rather to abuse its special privileges. This is a necessary consequence of the difference in their nature: a service managed by the Government cannot respond to the requirements of a certain section of the public whilst refusing to comply with the demands of another section, but an industrial enterprise is able to effect improvements where they will be productive, without extending them to the whole country. So far as tariffs are concerned, private companies have too great a tendency to multiply special rates, whilst a State system is disinclined to accord them where they would be of utility, and will only effect reductions in the rates when it is able to proceed by means of a scale. Moreover, a private company always hesitates before permitting expenditure on branch lines whose productivity is problematical. A State administration, however, too readily decides to extend its lines even when these obviously will be burdensome. The former attempts to limit service improvements to the point at which they will be absolutely productive, whilst the latter will often have difficulty in effecting improvements at a point where they would be useful without granting similar advantages to other points where they are not at all necessary.

Thus the reasons for and against State railways balance fairly well. Experimentally, it would be very difficult to decide which *régime* has best succeeded,

In France the State system is not of sufficient importance to permit of any real appreciation of the question. Moreover, a study of the circumstances of other countries, where one or the other system predominates, is not more decisive. If one may form an opinion from the press and parliamentary debates, it would appear that the public complain as much of the companies where private enterprise is the rule, as of State railways where the Government manages the railways. Quite recently, several German traders complained of the difficulties that were experienced through the insufficiency of rolling stock, etc., on the Prussian State system; several times, also, have representatives of Belgian commerce formulated accusations of partiality against the Minister of Railways. These we mention merely to show that State systems do not escape any more than private companies from the criticisms to which every public service is subject. The development of traffic depends on too many elements foreign to the railway *régime* for statistics to be at all a conclusive proof of this question: further, if ground for a decision were sought, such could not be found; whilst under the company *régime* of England, commerce and industry in that country have considerably developed, Germany has obtained a favourable result under the State *régime;* and the United States is making rapid progress under private railway management. There are, however, two important reasons which impel us to prefer private management, these reasons being *political* and *financial* respectively.

So far as the *political* aspect is concerned, the operation of railways by the State presents exceedingly grave dangers. Extended to all the French lines,

this system would augment the Government debt by 1,600 million francs, and would increase the number of State employees by 300,000. To increase in such a manner the points of contact between governmental authority and the citizens is to enlarge the power of the State to a degree dangerous to the liberties of the public; under a parliamentary government it would mean extending the field open to electoral preferment with its moral and financial disadvantages. The greatest danger that could menace a democracy is the intrusion of politics in business, for such renders difficult the maintenance of discipline amongst the staff, who are numerous enough to exercise a serious influence on the result of the elections; further, there is considerable danger of corruption resulting from favours imperatively demanded by the electors of their representatives, and by them of the Ministers who are dependent on their votes. Experience has shown that the only countries where a liberal *régime* has had a long duration up to now are those where the development of State services is reduced to a minimum, as in England and the United States. To extend further the authority of the Administration in a country where it is already so largely developed as in France, means exposing the parliamentary *régime* to singular risks.

Regarding the question from the *financial* point of view, universal experience indicates that it is difficult to render the working of a State system satisfactory. A public administration, without the essential object of financial results, is not in the same position as a company which has carefully to retain its receipts and, especially, to curtail expenses. The high cost incurred in all industrial establishments managed by the State, such as manufactories of

tobacco or matches, marine arsenals, etc., is acknowledged by everybody. And the figures previously indicated of the expenses of the State railway systems of Belgium and Germany show that the costly character of State enterprises is not peculiar to France, and that the working of railways is no better in this regard than other industries.

In this connection, the example of Germany is particularly good, as Germany claims to have one of the best administrations in the world. The yearly expenses of the German State railways exceed those of the French railways by at least 12 to 15 per cent. Germany can support an expensive system on account of the abundance of the traffic, and extremely favourable conditions. In France, however, with a stationary population and little coal production, it is only due to an extremely economical management reducing the *co-efficient d'exploitation* lower than that of any other country that railway receipts cover the expenses. If France had a State system, even no more expensive than Germany, an additional 100 to 200 million francs would be expended every year. This would represent a deficit which taxpayers would have to meet, and it would be a still larger deficit if the majority of the expenses were increased in accordance with the proportion justified by the greater cost of coal, the lower traffic density, and many other circumstances.

We are, then, convinced that the private system is preferable to the State system from both *financial* and *political* aspects. The method of control which extensively exists in France shows, in addition, that it is not incompatible with an effective supervision by the Public authority. This system, intermediate between that of Germany and the Anglo-Saxon countries,

engages less responsibility on the part of the State than direct operation, whilst it leaves less scope for an arbitrary policy on the part of the companies than on freely managed private lines. As in all collaboration, a certain *entente* is essential between the two parties, and this necessarily causes many formalities, some of which could doubtless be simplified. The multiplicity of the methods of control and the financial connection between the State and the companies often causes considerable complication. Opinion has a constant tendency to overlook the fact that control is not management and, especially, that, to control properly, it is unnecessary to go into details. To judge with impartiality the management of the railway enterprise, it should be regarded from the standpoint of its obligations to the public and to the Treasury. A small number of well-chosen officials should certainly be able to obtain as good results as the army of control agents who multiply indefinitely the administrative formalities. In the French system, the tension which sometimes occurs between the State representatives and the *concessionnaires* at times prevents problems receiving the best possible solution. The existing control in France does, however, give to the State sufficient power to prevent abuses, and to compel the companies to afford the public service under convenient conditions.

In England and America guarantees are given to the public by laws prohibiting the abuses, and by the establishment of Commissions whose duty it is to see the laws are observed. In both countries, judicial authority definitely settles the many difficulties that arise, such questions as the equity of tariffs, undue preference, and public facilities receiving consideration.

This procedure leaves the railways free to respond to the requirements of commerce. To extend the scope of the public authority, the Board of Trade in England, and the Interstate Commerce Commission in America have been accorded power to investigate abuses. The legal control of the two countries has certain conditions similar to those of our administrative control, but whilst the systems are somewhat similar, each has its own distinct character. The English and American laws in regard to tariffs have, in fact, indicated certain principles which have inspired French administrative practice, *e.g.*, the short haul clause. But in the former countries they have not fallen into the grave error of believing that a commercial matter, such as the determination of transport prices, could be made the purpose of definite legislation fixing an exact relation between them.

In general it may be said that the transport *régime* of France has assured a service to the public at least equal to that of other countries. It is to be regretted that the State has thought fit to exempt all traffic from toll on certain lines, rather than attempt to reduce charges on all lines for the heavy traffic which is essential to the development of agriculture and industry. But this, and other errors, have not prevented the results obtained being well in accord with the sacrifices made.

Certain considerations are often overlooked when insistent claims are made for new works, general tariff reductions or expensive service improvements. Commerce, agriculture and industry feel any advantages they may procure directly, but they do not observe the subsequent charges which are a corollary to the previous advantages. The indirect benefits derived by the community from the development of

transport are often specially noticed ; but the indirect losses caused through the increase of public taxes are often overlooked—and these, after all, come back to the producer. It is impossible to deny that the heavy taxes in France weigh heavily on agriculture, and considerably impede the development of several industries. Often is mention made of the *rôle* in business played by cost of transport by railway, the total cost of which, including passengers, did not exceed 1,700 million francs in 1906. What, then, should be said of the *rôle* played by general and local taxes, the total of which exceeds 4 milliards ?

These incidents compel us always to consider the intimate hold exercised by the State on the means of communication, and the relation they bear to the Budget. We do not intend to imply dissatisfaction with, or lukewarm appreciation of, the technical improvements and tariff reductions that have largely contributed to the present welfare. We have placed under review all the advantages, but these cannot conceivably be forgotten. The rendering of the service of transportation in the interests of the country must be accomplished with due regard to the constant necessity of comparing costs with results achieved, for it is essential that the effecting of improvements shall not cease except in face of the possibility of the cost thereof having to be recouped by means of unjustified public charges from the considerably augmented national wealth, to which the facility and cheapness of transport have so largely contributed during the last century.

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